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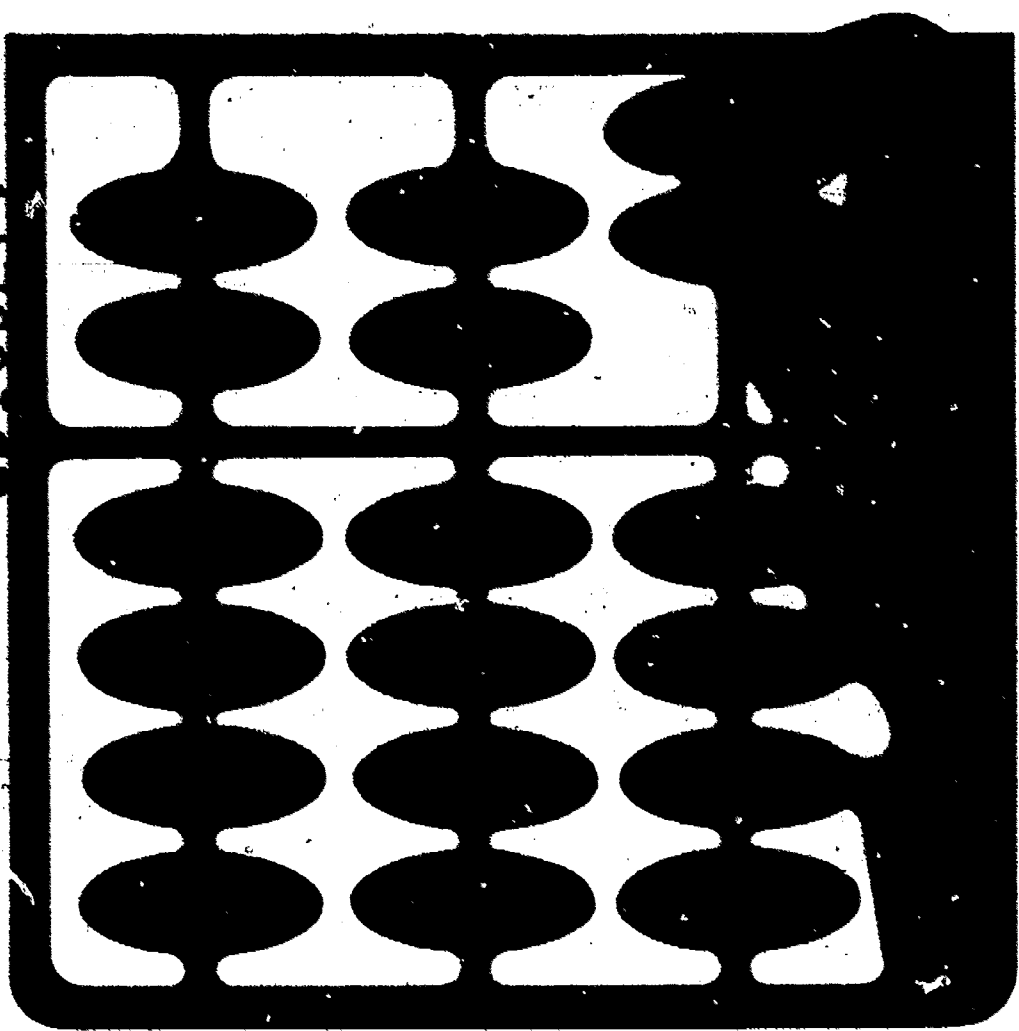
ABSTRACT

This report summarizes the results of the National Assessment of Educational Progress 1977-78 assessment of mathematics. Chapter one provides general information about mathematics assessments and includes discussion of the objectives, samples, exercises, statistics, and background variables of the assessment. Chapter two considers changes in performance between the first mathematics assessment conducted in 1972-73 and the second assessment being considered in this report. The third chapter describes performance for the nation and standard variable groups. Sections in this chapter include: region, sex, race/ethnicity, level of parental education, type of community, community size, and grade in school. Chapter four gives results for nonstandard variable groups. The two appendices discuss the estimation of standard errors and the source questions for special variables. (MK)

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MATHEMATICAL TECHNICAL REPORT: SUMMARY VOLUME



NAEP

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MATHEMATICS TECHNICAL REPORT:

SUMMARY VOLUME

Report No. 09-MA-21

by the
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FOREWORD

When the U.S. Office of Education was chartered in 1867, one charge to its commissioners was to determine the nation's progress in education. The National Assessment of Educational Progress (NAEP) was initiated a century later to address, in a systematic way, that charge.

Each year since 1969, National Assessment has gathered information about the levels of education achievement across the country and reported its findings to the nation. NAEP surveys the education attainments of 9-year-olds, 13-year-olds, 17-year-olds and young adults, ages 26-35, in 10 learning areas: art, career and occupational development, citizenship, literature, mathematics, music, reading, science, social studies and writing. Different learning areas are assessed every year, and all areas are periodically reassessed in order to measure possible changes in education achievement. National Assessment has interviewed and tested more than 810,000 young Americans since 1969.

Learning-area assessments evolve from a consensus process. Each assessment is the product of several years of work by a great many educators, scholars and lay persons from all over the nation. Initially, these people design objectives for each subject area, proposing general goals they feel Americans should be achieving in the course of their education. After careful reviews, these objectives are given to exercise (item) writers, whose task it is to create measurement tools appropriate to the objectives.

When the exercises have passed extensive reviews by subject-matter specialists, measurement experts and lay persons, they are administered to probability samples. The people who compose these samples are chosen in such a way that the results of their assessment can be generalized to an entire national population. That is, on the basis of the performance of about 2,500 9-year-olds on a given exercise, we can make generalizations about the probable performance of all 9-year-olds in the nation.

After assessment data have been collected, scored and analyzed, National Assessment publishes reports to disseminate the results as widely as possible. Not all exercises are released for publication. Because NAEP will readminister some of the same exercises in the future to determine whether the performance level of Americans has increased, remained stable or decreased, it is essential that they not be released in order to preserve the integrity of the study.

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Many organizations and individuals have made substantial contributions to this report. Not the least of those to be gratefully acknowledged are the administrators, teachers and students who cooperated so generously during the collection of the data.

Special acknowledgment must go to Jane Armstrong of the National Assessment staff for the coordination of development efforts and to Stuart Kahl and George Moreno for their assistance. Also to be acknowledged are the substantial contributions in guiding item development and report planning made by the members of the Mathematics Advisory Board: Sarah Herriot, Prince Jackson, Jeremy Kilpatrick, Donald Kreider, John LeBlanc and James Wilson.

Administration of the mathematics assessment was conducted by the Research Triangle Institute, Raleigh, North Carolina. Scoring and processing were carried out by the Measurement Research Center, Iowa City, Iowa, and by the National Assessment staff.

The actual preparation of this report was a collaborative effort of the National Assessment staff. Special thanks must go to the following people: Ingrid Larsson and Charlotte Overbury for data processing support; Ava Powell, Marci Reser and Carmen Nietes for production; Barbara Ward for editorial supervision. This report was written by Donald Phillips.



Roy H. Forbes
Director

CHAPTER 1

INFORMATION ABOUT THE MATHEMATICS ASSESSMENTS

Introduction

The National Assessment of Educational Progress (NAEP) has completed two assessments of mathematics. The first was conducted during 1972-73, and the second, during 1977-78. This report summarizes the changes in mathematics performance from the first assessment to the second, and also summarizes the 1977-78 status of mathematics achievement measured by National Assessment's exercises.

To measure changes in performance from 1972-73 to 1977-78, approximately one-half of the exercises used in the first assessment were reassessed in the second. The status of mathematics achievement in 1977-78 was assessed by sets of exercises designed to measure National Assessment's 1977-78 mathematics objectives.

This chapter will present a brief discussion of the mathematics objectives, the samples and procedures for the 1972-73 and 1977-78 assessments, and the statistics and background variables used in this report. It will be followed by chapters that present and briefly discuss the mean changes in performance from 1972-73 to 1977-78, mean results for the 1977-78 assessment reported by standard National Assessment background variables and mean results for background variables specific to the 1977-78 mathematics assessment.

Objectives

The 1972-73 mathematics objectives were organized into a three-dimensional scheme. The dimensions were:

1. Uses of mathematics
2. Mathematical content
3. Cognitive abilities

The "uses of mathematics" dimension proved to be of little usefulness in writing exercises and was effectively abandoned as a functioning dimension of these objectives.

Within "mathematical content" there were 17 content categories:

1. Number and numeration concepts
2. Properties of numbers and operations
3. Arithmetic computations

4. Sets
5. Estimation and measurement
6. Exponents and logarithms
7. Algebraic expressions
8. Equations and inequalities
9. Functions
10. Probability and statistics
11. Geometry
12. Trigonometry
13. Mathematical proof
14. Logic
15. Miscellaneous topics
16. Business and consumer mathematics
17. Attitude and interest

The "cognitive abilities" dimension contained six categories:

1. To recall and/or recognize definitions, facts and symbols
2. To perform mathematical manipulations
3. To understand mathematical concepts and processes
4. To solve mathematical problems -- social, technical and academic
5. To use mathematics and mathematical reasoning to analyze problem situations, define problems, formulate hypotheses, make decisions and verify results.
6. To appreciate and use mathematics

The "attitude and interest" objective of the content dimension was not measured at all during the 1972-73 assessment. Similarly, the "appreciation and use of mathematics" cognitive dimension was not addressed by the first assessment.

The objectives of the second assessment also employ a content dimension and a cognitive-process dimension. The content categories are:

1. Numbers and numeration
2. Variables and relationships
3. Shape, size and position
4. Measurement
5. Other topics

The cognitive-process categories are:

1. Mathematical knowledge
2. Mathematical skill
3. Mathematical understanding
4. Mathematical application

The objectives matrix for the 1977-78 assessment is essentially formed by collapsing and deleting categories from the mathematical content and cognitive abilities dimensions of the 1972-73 objectives. Attitudes toward mathematics became a separate component of the objectives for the second assessment of

mathematics and were not fitted into the above matrix.¹ Attitudes toward mathematics were assessed in the 1977-78 assessment, but they are not discussed in this report.

In addition to the objectives matrix, a set of questions to be addressed by the assessment was developed for the 1977-78 survey. It was intended that this set serve to help organize the reports of the second assessment. These questions are essentially organized along the lines of the cognitive-process dimension of the objectives, which are:

I. Mathematical knowledge

- A. How well can students recall and recognize facts, definitions and symbols?

II. Mathematical skill

- A. How well can students perform computations, including computations with whole numbers, integers, fractions, decimals, percents, ratios and proportions?
- B. How well can students make measurements?
- C. How well can students read graphs and tables?
- D. How well can students perform geometric manipulations like constructions and spatial visualizations?
- E. How well can students perform algebraic manipulations?
- F. How well can students estimate the answers to computations and measurements?

III. Mathematical understanding

- A. How well can students translate a verbal statement into symbols or figure, and vice versa?
- B. How well do students understand mathematical concepts and principles?

IV. Mathematical application

- A. How well can students solve typical textbook problems?

¹For a more complete discussion of the mathematics objectives, see Mathematics Objectives, Second Assessment (1978).

B. How well can students solve nonroutine problems?

C. How well can students estimate the answers to problems?

D. How well can students use mathematics in reasoning and making judgments?

National Assessment recognizes that the answers to all these questions cannot be supplied by the assessment. However, data can be provided that can give the reader some basis for formulating his or her own answers to these questions.

Reporting of both the changes in performance between the two assessments and the 1977-78 status results is organized by these questions. For the changes in performance, usually only the major headings were addressed. Some of the subtopics are not addressed in the status results because they were inadequately measured.

Sample

National Assessment uses a deeply stratified probability sample in which each individual is sampled with known probability.² The individual's performance is then weighted by the inverse of this known probability to give estimates of the national population at a particular age group who can perform particular tasks.

In 1977-78, the assessment sample included individuals enrolled in school who were aged 9, 13 and 17. In all, there was a total of more than 70,000 individuals included in the sample. There were 17,190 at age 9, 26,661 at age 13 and 26,756 at age 17 included in the 1977-78 sample. On the average, there were 2,456, 2,424 and 2,230 respondents for each exercise booklet at ages 9, 13 and 17, respectively.

The sample for the 1972-73 assessment was drawn in a similar way; however, there are some major differences. The first mathematics assessment included a sample of young adults aged 26-35 and a sample of 17-year-olds who were not enrolled in school. In the second mathematics assessment, both of these features proved to be beyond the resources available, so they were not included. Comparisons of 17-year-olds' performances are made only between the portions of the 1972-73 17-year-olds' sample who were enrolled in school during the assessment and the 1977-78 17-year-olds' sample.

²For more detailed documentation, see Chromy et al. (1974). For an introductory treatment aimed at state and local assessment problems, see Jaeger (1973).

In the first assessment, exercise booklets were administered in two different ways. One or two exercise booklets at each of the ages (9, 13 and 17) were administered in an individual-interview mode; the remaining booklets at these ages were administered to groups of students. Usually there were 10 to 12 persons per group for the group administrations. The exercises given in the individual-interview mode in the first assessment were not reassessed in 1977-78 as change measures.

There were 68,010 persons in the portion of the 1972-73 sample to be used in computing changes in performance from the first to the second mathematics assessment. Of these, 18,638 were 9-year-olds, 23,507 were 13-year-olds and 25,865 were 17-year-olds. As mentioned earlier, all of these were enrolled in school at the time of the assessment, and only those persons involved in group administrations were included in the comparison sample. On the average, in the first assessment comparison sample there were approximately 2,660, 2,610 and 2,350 respondents per exercise booklet at ages 9, 13 and 17, respectively.

Exercises

National Assessment used both multiple-choice exercises and open-ended, free-response exercises in each mathematics assessment. In the 1977-78 assessment, there was almost an even number of exercises for each of these types. The majority of the exercises that were used for change measures were open-ended, free-response exercises.

The 1972-73 responses to exercises used as change measures were rescored at the same time as the 1977-78 responses to these exercises, using the same scoring guides. To insure that each scorer was assigning scores in the same way, quality control procedures were established that compared multiple readings of the same response. On the average, these scores agreed 98.9%, 98.5% and 97.7% of the time for ages 9, 13 and 17, respectively, across all open-ended, free-response exercises.

Statistics

National Assessment does not report scores for individuals but rather reports estimated percentages of the nation and some subgroups of the nation that can answer an exercise correctly. National Assessment also reports, for the nation and these subgroups, the mean percentage correct across sets of exercises. In addition to these estimates, standard errors are calculated for both exercise percent correct and mean percent correct. These standard errors are estimated using a jackknife procedure.³

³See Appendix A.

In addition to percentages and mean percentages, many results for subgroups of the national population are expressed as percentage differences between the performance of the subgroup and the nation. These differences are reported both for exercises and for means across sets of exercises. As with the percentages correct, the variation due to sampling is estimated by jackknifed standard error estimates.

Measures of change are reported as the change in percentage correct or the change in difference from the nation on an exercise from 1972-73 to 1977-78 and as means of these changes in performance across sets of exercises. Standard error estimates for these measures of change are also estimated using the jackknife procedure.

This report presents (1) mean changes in performance from 1972-73 to 1977-78 and their associated standard errors and (2) means of 1977-78 performance and their associated standard errors. The sets of exercises across which the means are calculated are described along with the means.

It should be understood that all performance data in this report are mean percentages or mean percent differences from the nation. The words "mean" and "average" are used interchangeably. For consistency in reporting, National Assessment has arbitrarily adopted the significance level of $\alpha = .05$. Hence, National Assessment considers differences that are equal to or larger than twice their standard errors to be statistically significant. Throughout this report, unless otherwise stated, one can assume that statements about significance mean $\alpha = .05$.

Background Variables

In addition to reporting results for all age 9, age 13 and age 17 students in the United States, results are reported for a number of population subgroups. Definitions of several of these cut across all years of National Assessment's activities. Some of the population subgroups described are defined only for the 1977-78 mathematics assessment. Descriptions of the subgroups that are used for all years appear below; these are followed by descriptions of those that only apply to the 1977-78 mathematics assessment.

Sex

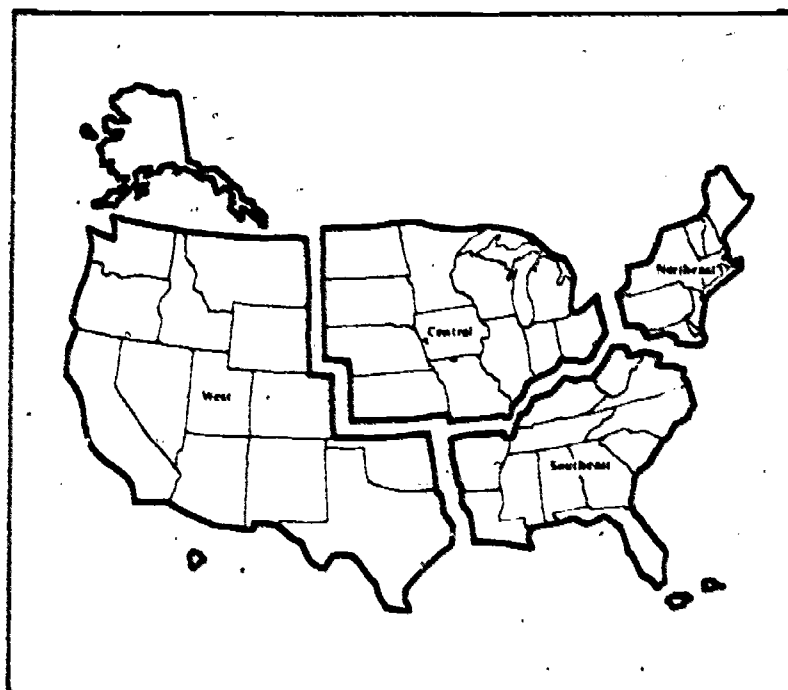
Results are reported for males and females.

Race/Ethnicity

Results are presented for blacks, whites and Hispanics. Only mean results are available for Hispanics in any National Assessment reports.

Region

The country has been divided into four regions: Northeast, Southeast, Central and West. States included in each region are shown on the following map.



Level of Parental Education

Three categories of parental-education levels are defined by National Assessment, based on students' reports. These categories are: those whose parents did not graduate from high school, those who have at least one parent who graduated from high school and those who have at least one parent who has had some post-high-school education.

Type of Community

Communities in this category are defined by an occupational profile of the area served by a school as well as by the size of the community in which the school is located.

Advantaged-urban communities. Students in this group attend schools in or around cities with a population greater than 200,000 where a relatively high proportion of the residents are in professional or managerial positions.

Disadvantaged-urban communities. Students in this group attend schools in or around cities with a population greater than 200,000 where a relatively high proportion of the residents are on welfare or are not regularly employed.

Extreme-rural communities. Students in this group attend schools in areas with a population under 10,000 where many of the residents are farmers or farm workers.

Size of Community

Big cities. Students in this group attend schools within the city limits of cities having a 1970 census population over 200,000.

Fringes around big cities. Students in this group attend schools within metropolitan areas (1970 U.S. Bureau of the Census urbanized areas) served by cities having a population greater than 200,000 but outside the city limits.

Medium cities. Students in this group attend schools in cities having a population between 25,000 and 200,000 not classified in the fringes-around-big-cities category.

Small places. Students in this group attend schools in communities having a population less than 25,000 not classified in the fringes-around-big-cities category.

Grade Level

Results are categorized by school grade for each of the ages, as shown below. Approximate percentages of respondents at each grade are also shown.

| <u>Age 9</u> | <u>Age 13</u> | <u>Age 17</u> |
|----------------|----------------|----------------------|
| Grades 3 and 4 | Grades 7 and 8 | Grades 10, 11 and 12 |
| 25% 72% | 26% 71% | 13% 75% 12% |

The background variables described below apply only to the 1977-78 mathematics assessment. Some of these variables are not defined for all age levels; the ages for which each applies appear with the description of the variable. Some of these variables are defined using self-report information provided by the respondents.⁴ The data for these variables appear in Chapter 4.

Sex by Race

Data are reported for black females, black males, white females and white males. Data for this variable are available only for age 9.

⁴See Appendix B for a copy of the 13- and 17-year-olds' self-report background questions used for these variables.

Grade by Race/Ethnicity

Data are reported for grade 3 blacks, grade 3 Hispanos, grade 3 whites, grade 4 blacks, grade 4 Hispanos and grade 4 whites. Data on this variable are available only for age 9.

Race by Type of Community

Data are reported for blacks living in advantaged-urban, disadvantaged-urban and extreme-rural communities, and for whites living in advantaged-urban, disadvantaged-urban and extreme-rural communities. Data on this variable are available only for age 9.

Region by Race/Ethnicity

Data are reported for blacks living in the Northeastern, Central, Western and Southeastern regions; for Hispanos living in the Northeastern, Central, Western and Southeastern regions; and for whites living in the Northeastern, Central, Western and Southeastern regions. Data on this variable are available only for age 9.

Use Hand Calculator

Data are available for ages 13 and 17. Results are reported for the following groups of students: those who reported using a hand calculator more than once a week, those who reported using a hand calculator less than once a week, those who reported using a hand calculator once a month and those who reported having never used a hand calculator.

How Much TV Watched

This variable is only defined for age 17 respondents. Results are reported for the following groups of students: students who reported watching less than one hour of TV yesterday, students who reported watching from one to two hours of TV yesterday, students who reported watching three or four hours of TV yesterday and students who reported watching five or more hours of TV yesterday.

Level of Mathematics Course Work

This variable is defined only for age 17 respondents. Results are reported for the following groups of students: students who reported not having taken at least one-half year of a first year algebra course; students who reported having taken at least one-half year of a first year algebra course, but no mathematics course beyond Algebra I; students who reported having taken at least one-half year of a geometry course, but no mathematics course beyond Geometry; students who reported having taken at least one-half year of a second

year algebra course, but no mathematics course beyond Algebra II; and students who reported having taken at least one-half year of a second year algebra course and at least one-half year of a mathematics course beyond Algebra II.

Sex by Level of Mathematics Course Work

This variable is defined only for age 17 respondents. Results are reported for males and females at each level of mathematics course work described above.

Race by Level of Mathematics Course Work

This variable is defined only for age 17 respondents. Results are reported for blacks and whites at each level of mathematics course work described above.

CHAPTER 2

CHANGES IN PERFORMANCE BETWEEN THE FIRST AND SECOND MATHEMATICS ASSESSMENTS

In this chapter, mean changes in performance from 1972-73 to 1977-78 are presented and discussed. There are several means at each age to be examined. For each age, the mean change in performance across all the exercises assessed in both the 1972-73 and 1977-78 assessments is presented. Means are also presented at each age for exercise subsets that measure particular mathematics topics or levels of mathematical functioning (Table 1). The exercises classified as knowledge ask about mathematics facts, definitions or identification of symbols. The mathematical skill exercises usually require using a learned algorithm, as in computation with whole numbers. Computation exercises are a subset of mathematical skill exercises and include computation with whole numbers, fractions and decimals. Mathematical understanding exercises typically require the respondent to translate from one form to another (for example, from an English sentence to an algebraic expression or equation). Application exercises usually require the solution of a problem that is expressed as a word problem.

The sets of computation, reading graphs and tables, and algebraic manipulation exercises are all subsets of the mathematical skills exercises. Similarly, the consumer problems exercise set is a subset of the mathematical application exercise set.

Mean changes in performance from 1972-73 to 1977-78 are presented in Tables 2 through 4 for ages 9, 13 and 17, respectively. Brief discussions of these results follow. Unless otherwise stated, all changes discussed in this chapter are statistically significant at the .05 level.

Age 9

The mean national change in performance across all exercises at age 9 is not significant for $\alpha = .05$; however, if $\alpha = .06$, then the decline is statistically significant. For the two subgroups of exercises measuring mathematical knowledge and mathematical skills and the subset of computation exercises there were no significant changes in mean national performance (Table 2). However, for the exercises measuring mathematical applications, the decline of about 6% from 1972-73 to 1977-78 in average performance is statistically significant.

Among the four regions reported upon, the decline in the West is the only change in performance across all exercises that is statistically significant.

TABLE 1. Titles of Sets of Mathematics Exercises for Which
Mean Changes in Performance From 1972-73
to 1977-78 Are Given

| | Number of Exercises | | |
|----------------------------|---------------------|--------|--------|
| | Age 9 | Age 13 | Age 17 |
| All change exercises | 55 | 77 | 102 |
| Mathematical knowledge | 17 | 16 | 18 |
| Mathematical skills | 21 | 37 | 46 |
| Computation | 12 | 17 | 17 |
| Read graphs and tables | --- | --- | 10 |
| Algebraic manipulation | --- | --- | 14 |
| Mathematical understanding | --- | 12 | 13 |
| Mathematical application | 9 | 12 | 25 |
| Consumer problems | --- | --- | 14 |

**Not enough exercises were in this set at this age for a meaningful average.*

For the three sets of exercises measuring knowledge, skills and computation, the only significant changes are the increases in performance of Southeastern students and performance relative to the nation on skill and computation exercises and the increases in the Northeasterners' performance relative to the nation on knowledge exercises. On application exercises, only the Southeastern students did not undergo a significant decline in performance. There were no changes in regional mean performance relative to the nation on application exercises.

Both males and females declined significantly on mathematical application. No other significant changes in performance or performance relative to the nation were found for age 9 males and females.

Age 9 black respondents showed significant increases in performance and performance relative to the nation on the entire set of exercises and on the knowledge, skill and computation subsets of exercises. In addition, this group showed a significant increase in performance, relative to the nation, on mathematical application exercises. Age 9 white respondents showed significant declines in performance on the entire set of exercises and on the application subgroup of exercises. They also had a significant decline in performance relative to the nation on the computation subset of exercises. Nine-year-old Hispanic respondents' performance did not change significantly on any of the sets of mathematics exercises reported here.

National Assessment reports three classifications of parental education, based on students reports. They are: those who have not graduated from high school, those who have graduated from high school and those with post-high-school education. At age 9, a considerable proportion (about 36%) of the respondents

TABLE 2. Age 9 -- Mean Change in Performance
From 1973-78

| | All Exercises (55 Exercises) | | | | Knowledge (17 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -1.27 | 0.66 | | | -0.78 | 0.84 | | |
| Northeast | 0.04 | 0.90 | 1.31 | 0.86 | 1.87 | 1.13 | 2.65* | 1.10 |
| Central | -1.73 | 1.26 | 0.04 | 1.04 | 0.36 | 1.54 | 1.14 | 1.27 |
| West | -3.69* | 1.46 | -2.42 | 1.25 | -3.39 | 2.02 | -2.61 | 1.69 |
| Southeast | 0.37 | 1.21 | 1.64 | 1.13 | -1.47 | 1.31 | -0.69 | 1.28 |
| Male | -1.18 | 0.72 | 0.07 | 0.28 | -0.26 | 0.93 | 0.52 | 0.45 |
| Female | -1.36 | 0.71 | -0.09 | 0.28 | -1.29 | 0.96 | -0.51 | 0.45 |
| White | -1.98* | 0.69 | -0.71 | 0.36 | -1.45 | 0.90 | -0.67 | 0.44 |
| Hispanic | 0.55 | 1.51 | 1.82 | 1.52 | 1.15 | 2.31 | 1.93 | 2.22 |
| Black | 2.89* | 0.76 | 4.16* | 0.89 | 3.39* | 1.44 | 4.17* | 1.50 |
| Post high school | -1.68* | 0.81 | -0.41 | 0.47 | -0.72 | 1.02 | 0.06 | 0.70 |
| Graduated high school | -2.39* | 0.84 | -1.12 | 0.61 | -2.08 | 1.22 | -1.30 | 0.90 |
| Not graduated high school | -2.34* | 1.11 | -1.07 | 1.02 | -2.22 | 1.62 | -1.44 | 1.41 |
| Advantaged urban | -0.68 | 1.35 | 0.59 | 1.43 | -1.60 | 1.71 | -0.82 | 1.83 |
| Disadvantaged urban | 2.45 | 1.61 | 3.72* | 1.63 | 2.69 | 2.62 | 3.47 | 2.61 |
| Extreme rural | -1.87 | 1.82 | -0.60 | 1.78 | -1.62 | 2.11 | -0.84 | 1.98 |
| Fringes around big cities | -1.01 | 1.37 | 0.26 | 1.31 | 0.71 | 1.86 | 1.49 | 1.74 |
| Big cities | -1.38 | 1.15 | -0.11 | 1.04 | -1.69 | 1.32 | -0.91 | 1.26 |
| Medium cities | -1.71 | 1.67 | -0.44 | 1.70 | -0.52 | 1.98 | 0.26 | 2.04 |
| Small places | -1.08 | 1.11 | 0.19 | 0.87 | -0.73 | 1.38 | 0.05 | 1.03 |
| 3rd grade | -0.41 | 0.91 | 0.86 | 0.68 | -0.07 | 1.27 | 0.71 | 0.94 |
| 4th grade | -1.43 | 0.72 | -0.16 | 0.34 | -0.77 | 0.93 | 0.01 | 0.46 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 2 (Continued). Age 9 -- Mean Change in Performance
From 1973-78

| | Skills (21 Exercises) | | | | Computation (12 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -0.39 | 0.65 | | | -0.58 | 0.80 | | |
| Northeast | -0.34 | 0.92 | 0.05 | 0.90 | -1.08 | 1.32 | -0.50 | 1.17 |
| Central | -1.07 | 1.32 | -0.68 | 1.07 | -1.56 | 1.69 | -0.98 | 1.37 |
| West | -2.24 | 1.55 | -1.85 | 1.31 | -1.80 | 1.58 | -1.22 | 1.41 |
| Southeast | 2.59* | 1.14 | 2.98* | 1.09 | -2.82* | 1.33 | 3.40* | 1.30 |
| Male | -0.65 | 0.75 | -0.26 | 0.31 | -1.04 | 0.89 | -0.46 | 0.42 |
| Female | -0.13 | 0.71 | 0.26 | 0.33 | -0.10 | 0.93 | 0.48 | 0.43 |
| White | -1.00 | 0.69 | -0.61 | 0.34 | -1.54 | 0.85 | -0.96* | 0.39 |
| Hispanic | 1.46 | 1.70 | 1.85 | 1.68 | 2.54 | 2.34 | 3.12 | 2.31 |
| Black | 3.02 | 0.79 | 3.41* | 0.89 | 4.41* | 1.15 | 4.99* | 1.15 |
| Post high school | -1.38 | 0.93 | -0.99 | 0.58 | -2.15 | 1.11 | -1.57* | 0.70 |
| Graduated high school | -0.50 | 0.89 | -0.11 | 0.71 | -0.08 | 1.03 | 0.50 | 0.84 |
| Not graduated high school | -1.11 | 1.25 | -0.72 | 1.17 | -0.80 | 1.51 | -0.22 | 1.43 |
| Advantaged urban | 1.12 | 1.66 | 1.51 | 1.61 | 1.72 | 2.21 | 2.30 | 2.07 |
| Disadvantaged urban | 0.86 | 1.24 | 1.25 | 1.32 | 2.14 | 1.97 | 2.72 | 1.98 |
| Extreme rural | -1.87 | 2.01 | -1.48 | 1.98 | -3.22 | 2.24 | -2.64 | 2.23 |
| Fringes around big cities | -1.08 | 1.39 | -0.69 | 1.26 | -0.65 | 1.62 | -0.07 | 1.45 |
| Big cities | -1.14 | 1.30 | -0.75 | 1.12 | 0.10 | 1.51 | 0.68 | 1.37 |
| Medium cities | -1.35 | 1.64 | -0.96 | 1.63 | -2.38 | 1.83 | -2.00 | 1.73 |
| Small places | 0.44 | 0.98 | 0.83 | 0.81 | -0.54 | 1.21 | 0.04 | 0.99 |
| 3rd grade | 0.45 | 0.83 | 0.84 | 0.76 | 0.69 | 0.95 | 1.27 | 0.91 |
| 4th grade | -0.59 | 0.79 | -0.20 | 0.37 | -0.82 | 0.98 | -0.24 | 0.46 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 2 (Continued). Age 9 -- Mean Change in Performance
From 1973-78

| | Mean Change in Percent Correct | Standard Error | Applications (9 Exercises) | Standard Error |
|---------------------------|--|-------------------|---|-------------------|
| | | | Mean Change in Difference From the Nation | |
| Nation | -5.90* | 0.96 | | |
| Northeast | -5.26* | 1.74 | 0.64 | 1.53 |
| Central | -5.53* | 1.75 | 0.37 | 1.47 |
| West | -8.36* | 1.78 | -2.46 | 1.61 |
| Southeast | -3.61 | 2.14 | 2.29 | 1.88 |
| Male | -5.90* | 1.14 | 0.00 | 0.59 |
| Female | -5.90* | 1.13 | 0.00 | 0.60 |
| White | -6.92* | 1.02 | -1.02 | 0.52 |
| Hispanic | -3.69 | 2.60 | 2.21 | 2.66 |
| Black | 0.19 | 1.54 | 6.09* | 1.55 |
| Post high school | -6.11* | 1.31 | -0.21 | 0.84 |
| Graduated high school | -8.37* | 1.42 | -2.47* | 1.17 |
| Not graduated high school | -8.45* | 1.89 | -2.55 | 1.85 |
| Advantaged urban | -5.97* | 2.48 | -0.07 | 2.48 |
| Disadvantaged urban | 2.40 | 2.91 | 8.30* | 2.92 |
| Extreme rural | -2.52 | 2.60 | 3.38 | 2.60 |
| Fringes around big cities | -6.36* | 2.07 | -0.46 | 1.93 |
| Big cities | -4.75* | 1.84 | 1.15 | 1.74 |
| Medium cities | -7.17* | 2.59 | -1.27 | 2.48 |
| Small places | -5.62* | 1.57 | 0.28 | 1.22 |
| 3rd grade | -3.74* | 1.39 | 2.16 | 1.18 |
| 4th grade | -6.57* | 1.03 | -0.67 | 0.48 |

*Indicates mean percentages significantly different from the nation at the .05 level.

was not able to supply us with enough information to classify them with respect to parent's education level; hence, a sizable portion at this age is classified as unknown.

Of the 9-year-olds who could be classified in a parental-education group, the post-high-school, graduated-high-school and not-graduated-high-school groups all showed significant declines for the means across all exercises and the mathematical application subgroup. The post-high-school and graduated-high-school groups had significant declines in performance relative to the nation on the computation and application exercise subsets, respectively.

The type-of-community variable includes three classifications -- advantaged-urban areas, disadvantaged-urban areas and extreme-rural areas. These type-of-community categories include less than half of the total set of respondents. The others are simply not reported for the purpose of this variable, which describes only extreme community types.

For the three type-of-community groups reported, only the disadvantaged-urban areas showed any significant increases. This group showed significant increases in performance relative to the nation for means across all exercises and for the application exercise subset. The advantaged-urban group declined significantly in its performance on the application exercises.

The four size-of-community groups all declined in mean performance for the set of mathematical application exercises. There were no other significant changes in performance or performance relative to the nation for these four groups.

Nearly all of the 9-year-old respondents were in either grade 3 or grade 4. Both grades 3 and 4 posted significant declines in performance for the set of application exercises. There were no other significant mean changes for grades 3 and 4.

Age 13

The mean performance of age 13 respondents as a whole declined significantly across all exercises and across subsets of mathematical skill, computation and application exercises (Table 3). There were no other significant mean changes for all 13-year-olds.

The West was the only region to show any significant change in either performance or performance relative to the nation. The West had a significant decline in performance on the set of mathematical application exercises.

Females' mean performance declined across all exercises and the sets of skill, computation and application exercises. Males' mean performance declined significantly on the sets of computation, understanding and application exercises. Neither males nor females showed any changes in performance relative to the nation.

TABLE 3. Age 13 -- Mean Change in Performance
From 1972-77

| | All Exercises (77 Exercises) | | | | Knowledge (16 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -2.04* | 0.98 | | | -0.27 | 0.99 | | |
| Northeast | -1.60 | 1.84 | 0.44 | 1.58 | -0.27 | 2.18 | 0.00 | 1.80 |
| Central | -2.12 | 1.98 | -0.08 | 1.60 | 0.72 | 2.00 | 0.99 | 1.61 |
| West | -1.41 | 1.74 | 0.63 | 1.58 | -1.56 | 1.59 | -1.29 | 1.51 |
| Southeast | -2.58 | 1.96 | -0.54 | 1.83 | 0.49 | 1.76 | 0.76 | 1.71 |
| Male | -1.79 | 0.97 | 0.25 | 0.30 | 0.57 | 1.02 | 0.84 | 0.43 |
| Female | -2.31* | 1.07 | -0.27 | 0.31 | -1.15 | 1.16 | -0.88 | 0.45 |
| White | -2.36* | 0.84 | -0.32 | 0.50 | -0.47 | 0.90 | -0.20 | 0.50 |
| Hispanic | -2.98 | 1.50 | -0.94 | 1.59 | -2.74 | 2.29 | -2.47 | 2.31 |
| Black | 0.57 | 1.19 | 2.61 | 1.35 | 2.38 | 1.78 | 2.65 | 1.81 |
| Post high school | -2.54* | 0.91 | -0.50 | 0.50 | -0.60 | 1.02 | -0.39 | 0.67 |
| Graduated high school | -2.56* | 0.95 | -0.52 | 0.56 | -0.30 | 1.10 | -0.03 | 0.71 |
| Not graduated high school | -2.53* | 1.07 | -0.49 | 0.97 | -1.62 | 1.33 | -1.35 | 1.32 |
| Advantaged urban | -4.23* | 1.08 | -2.19 | 1.30 | -2.65 | 1.97 | -2.38 | 1.98 |
| Disadvantaged urban | 1.97 | 2.07 | 4.01 | 2.66 | 4.96 | 3.34 | 5.23 | 3.28 |
| Extreme rural | -4.80 | 2.65 | -2.76 | 2.52 | -4.77 | 3.06 | -4.50 | 2.94 |
| Fringes around big cities | -0.47 | 1.64 | 1.57 | 1.39 | 1.02 | 1.99 | 1.29 | 1.71 |
| Big cities | -1.89 | 1.91 | 0.15 | 1.76 | 1.02 | 1.91 | 1.29 | 1.83 |
| Medium cities | 3.17 | 3.26 | 5.21 | 3.06 | 4.31 | 3.02 | 4.58 | 2.86 |
| Small places | -3.37* | 1.48 | -1.33 | 1.16 | -1.65 | 1.52 | -1.38 | 1.16 |
| 7th grade | -0.77 | 1.12 | 1.27 | 0.77 | 0.02 | 1.37 | 0.29 | 1.01 |
| 8th grade | -2.40* | 0.94 | -0.36 | 0.36 | -0.12 | 0.93 | 0.15 | 0.41 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 3 (Continued). Age 13 -- Mean Change in Performance From 1972-77

| | Skills (37 Exercises) | | | | Computation (17 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -2.42* | 1.11 | | | -2.78* | 1.18 | | |
| Northeast | -1.67 | 1.90 | 0.75 | 1.69 | -1.82 | 1.89 | 0.96 | 1.73 |
| Central | -3.17 | 2.15 | -0.75 | 1.77 | -3.92 | 2.23 | -1.14 | 1.83 |
| West | -0.42 | 2.21 | 2.00 | 1.93 | -0.33 | 2.28 | 2.45 | 2.01 |
| Southeast | -3.87 | 2.29 | -1.45 | 2.09 | -4.35 | 2.67 | -1.57 | 2.38 |
| Male | -2.07 | 1.16 | 0.41 | 0.39 | -2.69* | 1.24 | 0.09 | 0.40 |
| Female | -2.82 | 1.20 | -0.40 | 0.39 | -2.85* | 1.25 | -0.07 | 0.41 |
| White | -2.87* | 0.99 | -0.45 | 0.54 | -3.17* | 1.02 | -0.39 | 0.55 |
| Hispanic | -2.45 | 1.59 | -0.02 | 2.00 | -4.04 | 2.39 | -1.26 | 2.35 |
| Black | 0.71 | 1.38 | 3.13* | 1.50 | 0.30 | 1.66 | 3.08 | 1.59 |
| Post high school | -3.24* | 1.08 | -0.82 | 0.54 | -3.77* | 1.07 | -0.99 | 0.59 |
| Graduated high school | -3.01* | 1.09 | -0.59 | 0.67 | -3.59* | 1.20 | -0.81 | 0.74 |
| Not graduated high school | -2.77* | 1.25 | -0.35 | 1.01 | -2.51 | 1.66 | 0.27 | 1.37 |
| Advantaged urban | -5.29* | 1.41 | -2.87 | 1.59 | -3.91* | 1.66 | -1.13 | 1.85 |
| Disadvantaged urban | 1.92 | 2.87 | 4.34 | 2.84 | 2.74 | 3.85 | 5.52 | 3.75 |
| Extreme rural | -4.15 | 2.57 | -1.73 | 2.51 | -4.67 | 3.36 | -1.89 | 3.20 |
| Fringes around big cities | -0.61 | 1.93 | 1.81 | 1.60 | -0.97 | 2.03 | 1.81 | 1.70 |
| Big cities | -3.39 | 2.15 | -0.97 | 1.95 | -2.87 | 2.21 | -0.09 | 2.04 |
| Medium cities | 4.13 | 3.73 | 6.55 | 3.49 | 2.69 | 4.00 | 5.47 | 3.72 |
| Small places | -3.76* | 1.59 | -1.34 | 1.29 | -4.31* | 1.79 | -1.53 | 1.35 |
| 7th grade | -0.35 | 1.23 | 2.07* | 0.86 | 0.18 | 1.44 | 2.96* | 0.96 |
| 8th grade | -3.11* | 1.08 | -0.69 | 0.44 | -3.67* | 1.11 | -0.89 | 0.45 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 3 (Continued). Age 13 -- Mean Change in Performance
From 1972-77

| | Understanding (12 Exercises) | | | | Applications (12 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -1.91 | 0.99 | | | -3.39* | 1.05 | | |
| Northeast | -1.22 | 1.65 | 0.69 | 1.51 | -3.55 | 2.16 | -0.16 | 1.86 |
| Central | -2.52 | 2.28 | -0.61 | 1.76 | -2.30 | 2.26 | 1.09 | 1.77 |
| West | -1.52 | 1.67 | 0.39 | 1.57 | -4.17* | 1.59 | -0.78 | 1.54 |
| Southeast | -1.89 | 2.01 | 0.02 | 1.86 | -3.41 | 2.12 | -0.02 | 1.96 |
| Male | -2.25* | 0.99 | -0.34 | 0.44 | -3.86* | 1.07 | -0.47 | 0.53 |
| Female | -1.60 | 1.17 | 0.31 | 0.45 | -2.96* | 1.27 | 0.43 | 0.55 |
| White | -2.34* | 0.90 | -0.43 | 0.52 | -3.39* | 0.94 | 0.00 | 0.52 |
| Hispanic | -1.36 | 1.52 | 0.55 | 1.63 | -6.62* | 1.66 | -3.23 | 1.92 |
| Black | 0.46 | 1.59 | 2.37 | 1.69 | -2.23 | 1.24 | 1.16 | 1.41 |
| Post high school | -2.20* | 1.07 | -0.29 | 0.71 | -3.26* | 1.11 | 0.13 | 0.68 |
| Graduated high school | -2.57* | 1.21 | -0.66 | 0.89 | -4.21* | 1.21 | -0.82 | 0.74 |
| Not graduated high school | -2.24 | 1.52 | -0.33 | 1.35 | -3.34* | 1.56 | 0.05 | 1.57 |
| Advantaged urban | -1.36 | 1.59 | 0.55 | 1.65 | -5.95* | 1.64 | -2.58 | 1.80 |
| Disadvantaged urban | 1.74 | 3.48 | 3.65 | 3.37 | -1.70 | 2.84 | 1.69 | 2.71 |
| Extreme rural | -4.52 | 3.30 | -2.61 | 3.14 | -7.14* | 3.21 | -3.75 | 2.95 |
| Fringes around big cities | -0.42 | 1.43 | 1.49 | 1.41 | -2.08 | 2.14 | 1.31 | 1.77 |
| Big cities | -0.76 | 2.38 | 1.15 | 2.11 | -2.37 | 2.31 | 1.02 | 2.08 |
| Medium cities | 3.51 | 3.40 | 5.42 | 3.22 | -1.65 | 2.79 | 1.74 | 2.69 |
| Small places | -3.94* | 1.62 | -2.03 | 1.30 | -3.96* | 1.53 | -0.57 | 1.24 |
| 7th grade | -0.78 | 1.27 | 1.13 | 0.96 | -3.12* | 1.35 | 0.27 | 0.95 |
| 8th grade | -2.26* | 1.03 | -0.35 | 0.43 | -3.47* | 1.02 | -0.08 | 0.42 |

*Indicates mean percentages significantly different from the nation at the .05 level.

White 13-year-olds showed significant declines in performance across all exercises and the sets of skill, computation, understanding and application exercises; Hispanic 13-year-olds had a significant decline in performance on the set of application exercises; black 13-year-olds showed a significant increase in performance, relative to the nation, on the set of mathematical skill exercises. There were no other significant mean changes for these three groups.

Like 9-year-olds, some (15%) age 13 respondents were not classified in one of the three reported parental-education groups. For all three parental-education groups, significant declines in mean performance were found for all exercises and for the sets of skill, computation, understanding and application exercises, with the exception that changes for the not-graduated-high-school group were not significant for the computation or understanding sets. There were no significant changes in performance relative to the nation for these groups.

The advantaged-urban group's average performance declined significantly across all exercises and across the sets of skill, computation and application exercises. The only other significant average change for the type-of-community groups at age 13 was a decline for the extreme-rural group on the set of application exercises.

The only significant mean changes found for the size-of-community groups were for the small-places group. This group declined in performance for all the means reported here except for the set of mathematical knowledge exercises.

Nearly all age 13 respondents were in either grade 7 or 8. The eighth graders declined significantly in mean performance across all exercises and on sets of mathematical skills, computation, understanding and application exercises. The seventh graders increased significantly in mean performance relative to the nation on the sets of mathematical skill and computation exercises and declined significantly in mean performance for the set of application exercises.

Age 17

The mean performance of in-school 17-year-olds as a whole declined across all exercises and on sets of skill, computation, reading graphs and tables, algebraic manipulation, understanding, application and consumer problem exercises (Table 4). Only mathematical knowledge exercises showed no significant changes for 17-year-olds.

The Northeastern, Western and Southeastern regions declined significantly on most of the means reported. The exceptions were the sets of knowledge exercises for all regions and reading graphs and tables exercises for the Southeast. In addition, the average performance of the Central region declined significantly on the sets of computation and consumer problem exercises. The Central region's performance increased significantly relative to the nation on the sets of mathematical skill and reading graphs and tables exercises,

TABLE 4. Age 17 — Mean Change in Performance
From 1973-78

| | All Exercises (102 Exercises) | | | | Knowledge (18 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -3.55* | 0.65 | | | 0.12 | 0.76 | | |
| Northeast | -3.21* | 1.18 | 0.34 | 1.08 | 0.02 | 1.54 | -0.10 | 1.33 |
| Central | -1.68 | 1.31 | 1.87 | 1.01 | 1.74 | 1.44 | 1.62 | 1.13 |
| West | -5.82* | 1.31 | -2.27 | 1.15 | -2.07 | 1.31 | -2.19 | 1.22 |
| Southeast | -3.76* | 1.23 | -0.21 | 1.20 | 0.66 | 1.53 | 0.54 | 1.44 |
| Male | -3.92* | 0.70 | -0.37 | 0.30 | -0.25 | 0.82 | -0.37 | 0.40 |
| Female | -3.24* | 0.73 | 0.31 | 0.30 | 0.43 | 0.86 | 0.31 | 0.37 |
| White | -3.46* | 0.57 | 0.09 | 0.35 | 0.45 | 0.65 | 0.33 | 0.39 |
| Hispanic | -2.32* | 1.05 | 1.23 | 1.13 | -0.62 | 1.90 | -0.74 | 1.93 |
| Black | -2.62* | 0.81 | 0.93 | 0.81 | -0.38 | 1.50 | -0.50 | 1.34 |
| Post high school | -3.77* | 0.62 | -0.22 | 0.35 | -0.48 | 0.74 | -0.60 | 0.46 |
| Graduated high school | -4.57* | 0.57 | -1.02* | 0.42 | -0.59 | 0.87 | -0.71 | 0.57 |
| Not graduated high school | -4.74* | 0.85 | -1.19 | 0.70 | 0.30 | 1.16 | 0.18 | 1.03 |
| Advantaged urban | -2.24 | 1.30 | 1.31 | 1.29 | 0.72 | 1.17 | 0.60 | 1.28 |
| Disadvantaged urban | -5.68* | 1.92 | -2.13 | 2.02 | -3.63 | 2.54 | -3.75 | 2.56 |
| Extreme rural | -2.03 | 1.68 | 1.52 | 1.59 | 2.36 | 2.02 | 2.24 | 1.98 |
| Fringes around big cities | -2.88* | 1.42 | 0.67 | 1.30 | 0.54 | 1.49 | 0.42 | 1.29 |
| Big cities | -1.65 | 1.91 | 1.90 | 1.66 | -0.16 | 2.13 | -0.28 | 1.79 |
| Medium cities | -2.25 | 1.98 | 1.30 | 1.92 | 1.16 | 2.43 | 1.04 | 2.32 |
| Small places | -4.22* | 0.78 | -0.67 | 0.70 | 0.53 | 0.80 | 0.41 | 0.78 |
| 10th grade | -2.11* | 0.96 | 1.44 | 0.74 | 0.98 | 1.21 | 0.86 | 1.00 |
| 11th grade | -3.60* | 0.64 | -0.05 | 0.23 | 0.44 | 0.71 | 0.32 | 0.28 |
| 12th grade | -3.63* | 0.92 | -0.08 | 0.77 | -1.40 | 1.41 | -1.52 | 1.13 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 4 (Continued). Age 17 -- Mean Change in Performance
From 1973-78

| | Skills (46 Exercises) | | | | Computation (17 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -4.56* | 0.72 | | | -4.59* | 0.84 | | |
| Northeast | -4.47* | 1.37 | 0.09 | 1.24 | -3.33 | 1.85 | 1.26 | 1.58 |
| Central | -2.29 | 1.41 | 2.27* | 1.10 | -3.26* | 1.58 | 1.33 | 1.26 |
| West | -6.51* | 1.55 | -1.95 | 1.33 | -5.89* | 1.69 | -1.30 | 1.47 |
| Southeast | -5.46* | 1.30 | -0.90 | 1.26 | -6.27* | 1.56 | -1.68 | 1.52 |
| Male | -4.78* | 0.80 | -0.22 | 0.40 | -4.96* | 0.91 | -0.37 | 0.51 |
| Female | -4.36* | 0.82 | 0.20 | 0.38 | -4.27* | 1.04 | 0.32 | 0.48 |
| White | -4.57* | 0.65 | -0.01 | 0.39 | -4.62* | 0.78 | -0.03 | 0.45 |
| Hispanic | -3.66* | 1.44 | 0.90 | 1.50 | -4.65* | 2.29 | -0.06 | 2.21 |
| Black | -3.05 | 1.02 | 1.51 | 0.99 | -3.06 | 1.61 | 1.53 | 1.54 |
| Post high school | -4.57* | 0.74 | -0.01 | 0.44 | -4.93* | 0.81 | -0.34 | 0.57 |
| Graduated high school | -5.56* | 0.68 | -1.00 | 0.50 | -5.36* | 0.97 | -0.77 | 0.66 |
| Not graduated high school | -6.35* | 1.00 | -1.79* | 0.80 | -6.63* | 1.39 | -2.04 | 1.15 |
| Advantaged urban | -4.11* | 1.51 | 0.45 | 1.50 | -4.05* | 1.58 | 0.54 | 1.60 |
| Disadvantaged urban | -6.33* | 2.04 | -1.77 | 2.12 | -5.43* | 2.56 | -0.84 | 2.62 |
| Extreme rural | -2.31 | 1.78 | 2.25 | 1.69 | -3.99 | 2.00 | 0.60 | 1.90 |
| Fringes around big cities | -4.22* | 1.62 | 0.34 | 1.48 | -4.12* | 1.80 | 0.47 | 1.67 |
| Big cities | -2.59 | 2.02 | 1.97 | 1.78 | -3.32 | 2.64 | 1.27 | 2.28 |
| Medium cities | -2.52 | 2.48 | 2.04 | 2.38 | -3.06 | 2.25 | 1.53 | 2.17 |
| Small places | -5.28* | 0.90 | -0.72 | 0.79 | -5.10* | 1.12 | -0.51 | 0.93 |
| 10th grade | -3.47* | 1.24 | 1.09 | 0.99 | -3.13 | 1.58 | 1.46 | 1.18 |
| 11th grade | -4.66* | 0.70 | -0.10 | 0.26 | -4.74 | 0.85 | -0.15 | 0.31 |
| 12th grade | -4.14* | 1.12 | 0.42 | 0.95 | -4.95* | 1.37 | -0.36 | 1.22 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 4 (Continued). Age 17 — Mean Change in Performance
From 1973-78

| | Read Graphs and Tables (10 Exercises) | | | | Algebraic Manipulation (14 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -3.35* | 0.89 | | | -3.78* | 0.95 | | |
| Northeast | -5.98* | 2.05 | -2.63 | 1.70 | -3.25 | 1.91 | 0.53 | 1.70 |
| Central | 0.64 | 1.16 | 3.99* | 1.13 | -1.26 | 2.10 | 2.52 | 1.59 |
| West | -6.14* | 2.04 | -2.79 | 1.71 | -6.19* | 1.70 | -2.41 | 1.56 |
| Southeast | -2.87 | 1.92 | 0.48 | 1.76 | -4.74* | 1.46 | -0.96 | 1.48 |
| Male | -4.33* | 1.37 | -0.98 | 0.85 | -4.07* | 1.22 | -0.29 | 0.56 |
| Female | -2.45* | 1.06 | 0.90 | 0.82 | -3.52* | 0.97 | 0.26 | 0.52 |
| White | -3.45* | 0.89 | -0.10 | 0.49 | -3.75* | 0.97 | 0.03 | 0.37 |
| Hispanic | 1.60 | 3.48 | 4.95 | 3.63 | -4.95* | 1.79 | -1.17 | 2.04 |
| Black | -0.05 | 2.08 | 3.30 | 1.94 | -3.01* | 1.12 | 0.77 | 1.16 |
| Post high school | -2.43* | 1.13 | 0.92 | 0.84 | -4.57* | 1.08 | -0.79 | 0.52 |
| Graduated high school | -5.99* | 1.33 | -2.64* | 1.25 | -3.93* | 0.93 | -0.15 | 0.64 |
| Not graduated high school | -5.13* | 2.16 | -1.78 | 1.81 | -3.99* | 1.03 | -0.21 | 0.96 |
| Advantaged urban | -1.14 | 2.16 | 2.21 | 2.22 | -3.66 | 2.77 | 0.12 | 2.59 |
| Disadvantaged urban | -5.75 | 3.48 | -2.40 | 3.32 | -6.93* | 1.98 | -3.15 | 2.16 |
| Extreme rural | 3.14 | 2.25 | 6.49* | 2.26 | -2.07 | 2.13 | 1.71 | 2.05 |
| Fringes around big cities | -2.40 | 2.08 | 0.95 | 1.81 | -3.58 | 2.25 | 0.20 | 1.95 |
| Big cities | -0.82 | 2.31 | 2.53 | 2.16 | -1.49 | 2.16 | 2.29 | 1.90 |
| Medium cities | -1.63 | 3.32 | 1.72 | 3.07 | -0.27 | 3.71 | 3.51 | 3.55 |
| Small places | -4.37* | 1.19 | -1.02 | 1.01 | -4.92* | 1.07 | -1.14 | 1.03 |
| 10th grade | -4.15 | 2.51 | -0.80 | 2.28 | -2.11 | 1.22 | 1.67 | 1.17 |
| 11th grade | -3.22* | 0.85 | 0.13 | 0.58 | -3.89* | 1.01 | -0.11 | 0.34 |
| 12th grade | -2.51 | 1.96 | 0.84 | 1.95 | -2.90 | 1.92 | 0.88 | 1.59 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 4 (Continued). Age 17 -- Mean Change in Performance
From 1973-78

| | Understanding (13 Exercises) | | | | Applications (25 Exercises) | | | |
|---------------------------|--|-------------------|---|-------------------|--|-------------------|---|-------------------|
| | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error | Mean Change in Percent Correct | Standard Error | Mean Change in Difference From the Nation | Standard Error |
| Nation | -4.44* | 0.86 | | | -3.85* | 0.65 | | |
| Northeast | -3.29* | 1.44 | 1.15 | 1.34 | -3.14* | 1.13 | 0.71 | 1.04 |
| Central | -2.40 | 1.69 | 2.04 | 1.32 | -2.62 | 1.34 | 1.23 | 1.00 |
| West | -8.93* | 1.89 | -4.49* | 1.59 | -5.61* | 1.21 | -1.76 | 1.10 |
| Southeast | -3.17* | 1.43 | 1.27 | 1.42 | -4.09* | 1.33 | -0.24 | 1.26 |
| Male | -4.63* | 0.97 | -0.19 | 0.50 | -4.57* | 0.76 | -0.72 | 0.40 |
| Female | -4.28* | 1.00 | 0.16 | 0.50 | -3.23* | 0.73 | 0.60 | 0.39 |
| White | -4.32* | 0.84 | -0.12 | 0.40 | -3.81* | 0.59 | 0.04 | 0.35 |
| Hispanic | -2.77 | 2.31 | 1.67 | 2.28 | -0.82 | 1.12 | 3.03* | 1.22 |
| Black | -3.59* | 1.27 | 0.85 | 1.33 | -2.91* | 0.75 | 0.94 | 0.80 |
| Post high school | -4.58* | 0.85 | -0.14 | 0.60 | -4.24* | 0.74 | -0.39 | 0.43 |
| Graduated high school | -5.84* | 1.03 | -1.40 | 0.75 | -4.89* | 0.68 | -1.04 | 0.57 |
| Not graduated high school | -5.82* | 1.49 | -1.38 | 1.34 | -4.83* | 0.87 | -0.98 | 0.76 |
| Advantaged urban | -1.51 | 1.41 | 2.93* | 1.46 | -1.30 | 1.85 | 2.55 | 1.73 |
| Disadvantaged urban | -8.57* | 2.38 | -4.13 | 2.51 | -4.42* | 1.89 | -0.57 | 1.96 |
| Extreme rural | -3.76 | 2.32 | 0.68 | 2.15 | -3.74* | 1.78 | 0.11 | 1.67 |
| Fringes around big cities | -4.94* | 1.87 | -0.50 | 1.69 | -1.80 | 1.42 | 2.05 | 1.30 |
| Big cities | -1.07 | 2.28 | 3.37 | 2.06 | -1.25 | 1.82 | 2.60 | 1.60 |
| Medium cities | -2.40 | 1.65 | 2.04 | 1.72 | -4.11* | 1.57 | -0.26 | 1.52 |
| Small places | -5.10* | 1.22 | -0.66 | 0.95 | -5.19* | 0.85 | -1.34 | 0.74 |
| 10th grade | -1.94 | 1.56 | 2.50 | 1.34 | -1.89* | 0.88 | 1.96* | 0.77 |
| 11th grade | -4.59* | 0.92 | -0.15 | 0.32 | -4.01* | 0.66 | -0.16 | 0.25 |
| 12th grade | -4.71* | 1.22 | -0.27 | 1.28 | -3.75* | 1.20 | 0.10 | 1.05 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 4 (Continued). Age 17 — Mean Change in Performance
From 1973-78

| | Mean Change in Percent Correct | Standard Error | Consumer Problems (14 Exercises) | |
|---------------------------|--|-------------------|---|-------------------|
| | | | Mean Change in Difference From the Nation | Standard Error |
| Nation | -4.34* | 0.74 | | |
| Northeast | -5.23* | 1.53 | -0.89 | 1.32 |
| Central | -2.58* | 1.07 | 1.76 | 0.98 |
| West | -6.04 | 1.71 | -1.70 | 1.42 |
| Southeast | -3.65* | 1.68 | -0.69 | 1.53 |
| Male | -5.36* | 1.04 | -1.02 | 0.63 |
| Female | -3.44* | 0.88 | 0.90 | 0.62 |
| White | -4.68* | 0.71 | -0.34 | 0.38 |
| Hispanic | 1.53 | 1.91 | 5.87* | 1.98 |
| Black | -0.96* | 1.52 | 3.78* | 1.42 |
| Post high school | -4.10* | 0.94 | 0.24 | 0.63 |
| Graduated high school | -0.13* | 1.05 | -1.79 | 0.95 |
| Not graduated high school | -6.06* | 1.48 | -1.72 | 1.21 |
| Advantaged urban | -2.63 | 1.53 | 1.71 | 1.62 |
| Disadvantaged urban | -3.14 | 2.95 | 1.20 | 2.81 |
| Extreme rural | -1.40 | 2.04 | 2.94 | 1.91 |
| Fringes around big cities | -2.94 | 1.49 | 1.40 | 1.40 |
| Big cities | -1.15 | 1.94 | 3.19 | 1.80 |
| Medium cities | -3.75 | 2.73 | 0.59 | 2.58 |
| Small places | -5.81* | 1.10 | -1.47 | 0.86 |
| 10th grade | -3.90* | 1.75 | 0.44 | 1.68 |
| 11th grade | -4.30* | 0.79 | 0.04 | 0.44 |
| 12th grade | -4.44* | 1.49 | -0.10 | 1.51 |

*Indicates mean percentages significantly different from the nation at the .05 level.

while the West declined significantly in performance relative to the nation on the set of understanding exercises.

Both age 17 males and females declined significantly in performance across all sets of mathematics exercises. There were no significant changes in the relative performance of males and females on any of the sets of exercises.

White 17-year-olds declined significantly for all means reported except mathematical knowledge exercises. Black and Hispanic 17-year-olds also declined in mean performance on many reported means. The exceptions for blacks were the knowledge, computation, reading graphs and tables, and consumer problem exercise sets. Exceptions for Hispanics are the knowledge, reading graphs and tables, understanding, application and consumer problem sets of exercises. Hispanics showed significant increases in average performance relative to the nation on the application and consumer problem sets of exercises. Blacks showed a similar increase on consumer problem exercises.

All three parental-education groups declined significantly in mean performance across all exercises and all exercise subsets except knowledge. The graduated-from-high-school group also declined in performance relative to the nation across all exercises and on the set of reading charts and tables exercises. The not-graduated-high-school group had a decline relative to the nation on the set of mathematical skill exercises.

The disadvantaged-urban group declined in performance across all exercises and for the sets of skill, computation, algebraic manipulation, understanding and application exercises. The advantaged-urban group declined in performance on the sets of skill and computation exercises, but increased in performance relative to the nation on the set of understanding exercises. The extreme-rural group declined in performance on the set of application exercises and increased in performance relative to the nation on the set of reading graphs and tables exercises.

The small-places group declined significantly in performance on all means except the set of knowledge exercises. The urban-fringe group declined in performance across all exercises and sets of skill, computation and understanding exercises. There were no other changes in performance for any of the size-of-community groups except for a decline on application exercises by the medium-city group.

Tenth, 11th and 12th graders all declined in average performance across all exercises and the sets of skill, application and consumer problem exercises. Eleventh and 12th graders also declined on the sets of computation and understanding exercises. In addition, 11th graders declined on the sets of reading graphs and tables and algebraic manipulation exercises.

CHAPTER 3

PERFORMANCES FOR THE NATION AND STANDARD VARIABLE GROUPS ON THE 1977-78 MATHEMATICS ASSESSMENT

In this chapter, the 1977-78 mean mathematics performances are reported for 9-, 13- and 17-year-olds in school. Mean differences from the nation for the various subgroups are also included in the tables of means. Instead of the detailed discussions of significant changes for each subset of items that were presented in Chapter 2, this chapter will present the general patterns that emerge across the various sets of mathematics exercises. Some of the exceptions to these patterns will also be presented.

Table 5 presents the title of the sets of exercises for which means have been calculated and also gives the number of exercises in each set at each age. The numbers and numeration, geometry knowledge and measurement knowledge sets of exercises are subsets of the mathematical knowledge set. The place value, basic facts, ordering, and numbers and operation properties exercises are subsets of the set of number and numeration exercises. A similar organization scheme applies for the mathematical skill and mathematical application sets of exercises. No subsets are reported for the mathematical understanding exercises. For skills, there are six major subsets of exercises: computation, measurement skills, reading graphs and tables, geometric manipulation, algebraic manipulation and estimations. Computation, measurement skills and algebraic manipulation are divided into subsets. Mathematical application is subdivided into three major subsets of which only routine problems is further divided into subsets.

There were not enough items for means for some topics at some ages because the topics were not as appropriate at some ages as others. Notice also that no overall mean percentages are reported. It was felt that means for the four levels of cognitive process provided more useful information than would an overall mean.

The results for ages 9, 13 and 17 for the 1977-78 assessment are presented in Tables 6 through 8, respectively. The following discussion describes in general terms mean performance for the different variables for all three age levels.

Region

For all ages, the Northeastern and Central regions of the country were significantly above the nation in average performance on most sets of mathematics exercises. On no set were either of these two groups significantly below

TABLE 5. Titles of Sets of Mathematics Exercises

| <u>Title of Set of Mathematics Exercise</u> | <u>Number of Exercises in the Set</u> | | |
|--|---------------------------------------|---------------|---------------|
| | <u>Age 9</u> | <u>Age 13</u> | <u>Age 17</u> |
| Mathematical knowledge | 161 | 147 | 140 |
| Numbers and numeration | 120 | 86 | 68 |
| Place value | 30 | 16 | * |
| Basic facts | 54 | 23 | 23 |
| Ordering | 15 | 15 | 11 |
| Number and operation properties | 16 | 18 | 18 |
| Geometry knowledge | 25 | 44 | 46 |
| Measurement knowledge | 16 | 17 | 17 |
| Mathematical skills | 137 | 272 | 273 |
| Computation | 48 | 129 | 127 |
| Whole number computation | 20 | 20 | 18 |
| Computation with fractions | * | 34 | 30 |
| Computation with decimals | * | 18 | 18 |
| Computation with integers | * | 22 | 21 |
| Measurement skills | 30 | 32 | 21 |
| Making measurements | 18 | 12 | * |
| Finding perimeter area and volume | * | 12 | * |
| Reading graphs and tables | 16 | 27 | 29 |
| Geometric manipulation | 15 | 19 | 15 |
| Algebraic manipulation | 19 | 43 | 59 |
| Solving equations | 10 | 13 | 16 |
| Simplifying and factoring | * | * | 11 |
| Plotting points | * | 15 | * |
| Graphing equalities and inequalities | * | * | 12 |
| Estimation | * | 22 | 22 |
| Mathematical understanding | 44 | 108 | 105 |
| Mathematical application | 44 | 106 | 136 |
| Routine problems | 33 | 85 | 114 |
| One-step word problems | 18 | 27 | 20 |
| Multistep word problems | * | 13 | 30 |
| Graph and table problems | * | 13 | 15 |
| Geometric problems | * | 13 | 18 |
| Measurement problems | * | * | 13 |
| Nonroutine problems | * | * | 10 |
| Combination, statistics and probability problems | * | 11 | 13 |

**Not enough exercises were in this set at this age for a meaningful average.*

the nation in performance. The Southeastern students' performance was significantly below the national average on nearly all sets of exercises at all three ages. In addition, their performance was frequently significantly below

that of students of the other regions for ages 13 and 17. Westerners' performance, at ages 9 and 17, was frequently significantly below the average performance of the nation and below that of the Northeastern and Central students.

At age 13, Westerners' mean performance was significantly below the mean national performance only on the mathematical knowledge, geometry knowledge and measurement knowledge exercise sets. None of the other mean Western 13-year-olds' performances differed significantly from the national average. At age 17, none of the regions differed significantly from the nation in average performance for the whole number computation exercise set.

Sex

At age 9, females tended to outperform males on knowledge and skill sets of exercises, except for the measurement knowledge, measurement skill, making measurement and geometric manipulation exercise sets. On these sets of exercises and on the set of understanding exercises, males significantly outperformed females. On the mathematical application set of exercises, males' and females' average performance did not differ significantly. It should be noted that at age 9 differences in performance for males and females, although statistically significant, were often quite small (less than 2%) and may not be meaningful.

At age 13, females had a significantly higher performance level than males on the set of skill exercises, the computation, numbers and numeration, and the algebraic manipulation subsets of exercises. Males performed significantly higher than females on the set of understanding and the subsets of measurement knowledge, measurement skill, making measurement, geometric manipulation, estimation and most subsets of application exercises. Females had a significantly higher performance level than males on the following knowledge exercise subsets -- numbers and numeration, basic facts, and number and operation properties, and the sets of computation exercises.

At age 17, males' performance tended to be significantly higher than females' average performance on the majority of the sets of exercises. There are several exercise sets for which there are no significant differences between males' and females' performances. Females performed significantly superior to males on the sets of basic facts, whole number computation and decimal computation exercises.

Race/Ethnicity

For all ages, whites' performance was significantly higher than that of the nation and that of blacks and Hispanics on all exercise sets reported. At all ages, blacks' and Hispanics' mean performances were significantly below the national averages across all exercise sets. At age 9, Hispanics' mean performances were occasionally significantly higher than blacks' averages. At age 13, Hispanics' mean performances were often significantly above blacks' averages; at age 17, Hispanics' averages were usually higher than blacks' mean performances.

The size of the differences among whites', Hispanos' and blacks' average performance was larger for 17-year-olds than for 9- or 13-year-olds.

Level of Parental Education

Across all three ages and across all sets of exercises reported, the performance of the three parental-education groups relative to each other stayed constant. The post-high-school group had significantly higher performance than did the graduated-high-school and the not-graduated-high-school groups, and the graduated-high-school group performed significantly higher than did the not-graduated-high-school group. At all ages, the post-high-school group performed significantly higher than the national average, and the not-graduated-high-school group performed significantly lower than the nation on all sets of exercises. At age 9, the graduated-high-school group was generally not significantly different from the nation in average performance. However, at age 13 this group's performance was often significantly below that of the nation, and at age 17 their performance was usually significantly below the national average performance.

Type of Community

For all ages, the advantaged-urban group was significantly higher in average performance than the disadvantaged-urban group, extreme-rural group and the nation on all exercise sets. The disadvantaged-urban group was significantly lower than the nation in average performance on all exercise sets at all ages. The average performances of 9- and 13-year-olds living in extreme-rural areas were usually significantly below the average national performance. Seventeen-year-olds from the extreme-rural group tended not to be significantly different from the nation in average performance.

Community Size

The urban-fringe group consistently performed significantly above the national average at ages 9 and 13 across all exercise sets. At age 17, this group usually performed significantly higher than the national average. The big-city group's performance was significantly below that of the nation on nearly all the 9-year-olds' exercise sets and on many of the 13-year-olds' and 17-year-olds' exercise sets. The small-places group was significantly below the nation on very few exercise sets at age 9, but was below the nation on many of the exercise sets for 13- and 17-year-olds. At age 9, the medium-city group was not significantly different in performance from the nation on any of the exercise sets. However, at age 13 this group was significantly higher in performance than the nation on several exercise sets, and at age 17 the medium-city group's performance was significantly greater than the nation on many of the exercise sets.

Grade in School

As would be expected, 9-year-old 4th graders significantly outperformed 9-year-old 3rd graders on all exercise sets. Similarly at age 13, 8th graders significantly outperformed 7th graders, and 11th and 12th grade 17-year-olds significantly outperformed 10th grade 17-year-olds. On some exercise sets, the 12th graders significantly outperformed the 11th graders, especially in the subsets of algebraic manipulation and applications exercises.

TABLE 6. Age 9 -- Mean Performance Percentages
1978

| | Mathematical Knowledge | | (161 Exercises) | |
|-----------------------|------------------------|----------------|-------------------------------------|----------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 65.94 | 0.44 | | |
| Northeast | 69.66 | 0.69 | 3.72* | 0.66 |
| Central | 68.71 | 0.81 | 2.78* | 0.67 |
| West | 63.27 | 1.07 | -2.67* | 0.90 |
| Southeast | 61.50 | 0.82 | -4.44* | 0.79 |
| Male | 65.24 | 0.45 | -0.70* | 0.17 |
| Female | 66.66 | 0.48 | 0.72* | 0.18 |
| White | 68.38 | 0.46 | 2.44* | 0.23 |
| Hispanic | 56.73 | 1.12 | -9.21* | 1.07 |
| Black | 54.92 | 0.79 | -11.02* | 0.83 |
| Post High School | 71.26 | 0.50 | 5.32* | 0.34 |
| Grad. High School | 66.44 | 0.60 | 0.50 | 0.46 |
| Not Grad. High School | 57.23 | 0.85 | -8.71* | 0.73 |
| Advantaged Urban | 74.63 | 0.83 | 8.69* | 0.88 |
| Disadvantaged Urban | 55.36 | 1.26 | -10.58* | 1.24 |
| Extreme Rural | 61.42 | 1.62 | -4.52* | 1.64 |
| Fringes | 70.24 | 0.90 | 4.30* | 0.80 |
| Big City | 61.65 | 0.79 | -4.28* | 0.68 |
| Medium City | 67.10 | 1.44 | 1.16 | 1.44 |
| Small Place | 65.60 | 0.61 | -0.34 | 0.55 |
| 3rd Grade | 53.75 | 0.62 | -12.19* | 0.44 |
| 4th Grade | 70.20 | 0.49 | 4.27* | 0.25 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Numbers and Numeration | | (120 Exercises) | |
|-----------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 67.45 | 0.48 | | |
| Northeast | 71.57 | 0.84 | 4.11* | 0.78 |
| Central | 70.36 | 0.84 | 2.90* | 0.71 |
| West | 64.45 | 1.17 | -3.01* | 0.99 |
| Southeast | 62.82 | 0.96 | -4.63* | 0.89 |
| Male | 66.33 | 0.50 | -1.13* | 0.19 |
| Female | 68.60 | 0.54 | 1.15* | 0.20 |
| White | 70.15 | 0.50 | 2.69* | 0.26 |
| Hispanic | 56.93 | 1.28 | -10.52* | 1.21 |
| Black | 55.41 | 0.95 | -12.05* | 0.95 |
| Post High School | 73.06 | 0.54 | 5.60* | 0.39 |
| Grad. High School | 68.19 | 0.69 | 0.74 | 0.53 |
| Not Grad. High School | 57.77 | 1.03 | -9.68* | 0.87 |
| Advantaged Urban | 76.86 | 0.95 | 9.41* | 1.00 |
| Disadvantaged Urban | 55.90 | 1.38 | -11.55* | 1.36 |
| Extreme Rural | 62.83 | 1.92 | -4.62* | 1.94 |
| Fringes | 71.88 | 1.00 | 4.43* | 0.87 |
| Big City | 62.58 | 0.90 | -4.87* | 0.77 |
| Medium City | 69.02 | 1.64 | 1.56 | 1.65 |
| Small Place | 67.24 | 0.66 | -0.22 | 0.60 |
| 3rd Grade | 53.39 | 0.68 | -14.07* | 0.50 |
| 4th Grade | 72.38 | 0.55 | 4.92* | 0.28 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Place Value | | (30 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 63.43 | 0.52 | | |
| Northeast | 66.61 | 0.80 | 3.18* | 0.79 |
| Central | 66.64 | 0.92 | 3.21* | 0.77 |
| West | 60.71 | 1.36 | -2.72* | 1.13 |
| Southeast | 59.08 | 1.17 | -4.35* | 1.06 |
| Male | 63.03 | 0.55 | -0.41 | 0.31 |
| Female | 63.85 | 0.66 | 0.42 | 0.31 |
| White | 66.39 | 0.51 | 2.96* | 0.29 |
| Hispanic | 52.54 | 1.65 | -10.89* | 1.60 |
| Black | 50.19 | 0.78 | -13.25* | 0.81 |
| Post High School | 69.23 | 0.71 | 5.80* | 0.50 |
| Grad. High School | 64.30 | 0.81 | 0.97 | 0.60 |
| Not Grad. High School | 54.06 | 1.05 | -9.38* | 1.00 |
| Advantaged Urban | 71.67 | 1.03 | 8.24* | 1.06 |
| Disadvantaged Urban | 52.93 | 1.35 | -10.50* | 1.46 |
| Extreme Rural | 60.00 | 1.69 | -3.43 | 1.75 |
| Fringes | 66.38 | 1.14 | 2.95* | 0.96 |
| Big City | 59.48 | 1.00 | -3.95* | 0.85 |
| Medium City | 65.53 | 2.30 | 2.10 | 2.28 |
| Small Place | 63.39 | 0.64 | -0.04 | 0.58 |
| 3rd Grade | 52.78 | 0.79 | -10.66* | 0.59 |
| 4th Grade | 67.17 | 0.60 | 3.74* | 0.28 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| Basic Facts | | | (54 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 76.90 | 0.59 | | |
| Northeast | 80.79 | 1.26 | 3.90* | 1.09 |
| Central | 80.02 | 0.94 | 3.12* | 0.83 |
| West | 73.86 | 1.30 | -3.04* | 1.12 |
| Southeast | 72.17 | 1.13 | -4.73* | 1.04 |
| Male | 75.19 | 0.65 | -1.70* | 0.28 |
| Female | 78.65 | 0.66 | 1.75* | 0.29 |
| White | 79.76 | 0.64 | 2.86* | 0.28 |
| Hispanic | 65.48 | 1.44 | -11.42* | 1.42 |
| Black | 64.08 | 1.20 | -12.82* | 1.21 |
| Post High School | 82.68 | 0.67 | 5.78* | 0.48 |
| Grad. High School | 77.51 | 0.85 | 0.62 | 0.62 |
| Not Grad. High School | 66.31 | 1.17 | -10.09* | 1.02 |
| Advantaged Urban | 87.97 | 1.14 | 11.08* | 1.12 |
| Disadvantaged Urban | 64.06 | 1.83 | -12.83* | 1.80 |
| Extreme Rural | 71.20 | 2.47 | -5.70* | 2.48 |
| Fringes | 82.34 | 1.10 | 5.44* | 0.94 |
| Big City | 71.25 | 1.04 | -5.64* | 0.96 |
| Medium City | 78.60 | 1.87 | 1.71 | 1.77 |
| Small Place | 76.44 | 0.79 | -0.46 | 0.70 |
| 3rd Grade | 59.70 | 0.88 | -17.20* | 0.70 |
| 4th Grade | 82.96 | 0.71 | 6.06* | 0.37 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Ordering | | (15 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 66.19 | 0.33 | | |
| Northeast | 67.85 | 0.42 | 1.66* | 0.46 |
| Central | 67.95 | 0.44 | 1.76* | 0.45 |
| West | 65.19 | 0.98 | -1.00 | 0.77 |
| Southeast | 63.43 | 0.66 | -2.75* | 0.59 |
| Male | 65.95 | 0.44 | -0.23 | 0.21 |
| Female | 66.41 | 0.36 | 0.22 | 0.22 |
| White | 67.54 | 0.35 | 1.35* | 0.18 |
| Hispanic | 61.43 | 1.18 | -4.75* | 1.03 |
| Black | 60.03 | 0.76 | -6.16* | 0.72 |
| Post High School | 68.76 | 0.47 | 2.57* | 0.31 |
| Grad. High School | 66.82 | 0.52 | 0.63 | 0.50 |
| Not Grad. High School | 62.14 | 1.18 | -4.04* | 1.04 |
| Advantaged Urban | 69.48 | 0.64 | 3.29* | 0.66 |
| Disadvantaged Urban | 61.44 | 0.98 | -4.74* | 0.97 |
| Extreme Rural | 65.17 | 1.78 | -1.02 | 1.62 |
| Fringes | 68.44 | 0.48 | 2.25* | 0.47 |
| Big City | 63.37 | 0.55 | -2.81* | 0.50 |
| Medium City | 67.29 | 0.62 | 1.10 | 0.62 |
| Small Place | 66.16 | 0.51 | -0.03 | 0.34 |
| 3rd Grade | 60.42 | 0.54 | -5.77* | 0.39 |
| 4th Grade | 68.26 | 0.38 | 2.07* | 0.15 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| Number and Operation Properties (16 Exercises) | | | | |
|--|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 45.92 | 0.77 | | |
| Northeast | 54.23 | 1.40 | 8.30* | 1.24 |
| Central | 47.70 | 1.12 | 1.77 | 1.06 |
| West | 40.73 | 1.73 | -5.19* | 1.47 |
| Southeast | 40.88 | 1.72 | -5.04* | 1.51 |
| Male | 44.55 | 0.88 | -1.37* | 0.42 |
| Female | 47.30 | 0.87 | 1.38* | 0.43 |
| White | 48.22 | 0.79 | 2.30* | 0.38 |
| Hispanic | 36.61 | 2.44 | -9.31* | 2.24 |
| Black | 35.50 | 1.82 | -10.43* | 1.66 |
| Post High School | 52.53 | 0.91 | 6.60* | 0.66 |
| Grad. High School | 46.78 | 1.06 | 0.86 | 0.75 |
| Not Grad. High School | 34.70 | 2.04 | -11.22* | 1.80 |
| Advantaged Urban | 56.31 | 2.12 | 10.39* | 2.15 |
| Disadvantaged Urban | 32.53 | 2.72 | -13.39* | 2.56 |
| Extreme Rural | 41.40 | 2.80 | -4.52 | 2.81 |
| Fringes | 51.34 | 1.70 | 5.41* | 1.63 |
| Big City | 40.70 | 1.64 | -5.22* | 1.34 |
| Medium City | 45.92 | 2.05 | 0.00 | 2.18 |
| Small Place | 45.95 | 1.23 | 0.03 | 0.95 |
| 3rd Grade | 29.01 | 0.92 | -16.92* | 0.84 |
| 4th Grade | 51.75 | 0.83 | 5.83* | 0.47 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Geometry Knowledge | | (25 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 58.74 | 0.49 | | |
| Northeast | 60.69 | 0.62 | 1.95* | 0.68 |
| Central | 61.42 | 1.12 | 2.68* | 0.85 |
| West | 57.60 | 0.98 | -1.14 | 0.87 |
| Southeast | 54.60 | 1.07 | -4.14* | 0.98 |
| Male | 59.05 | 0.58 | 0.32 | 0.27 |
| Female | 58.43 | 0.54 | -0.31 | 0.27 |
| White | 60.49 | 0.56 | 1.75* | 0.23 |
| Hispanic | 54.12 | 1.06 | -4.62* | 1.06 |
| Black | 50.08 | 1.02 | -8.65* | 1.02 |
| Post High School | 63.28 | 0.54 | 4.54* | 0.34 |
| Grad. High School | 58.47 | 0.68 | -0.26 | 0.48 |
| Not Grad. High School | 53.25 | 1.04 | -5.49* | 0.99 |
| Advantaged Urban | 65.85 | 0.98 | 7.11* | 0.98 |
| Disadvantaged Urban | 49.66 | 1.30 | -9.08* | 1.24 |
| Extreme Rural | 55.29 | 1.20 | -3.45* | 1.26 |
| Fringes | 63.04 | 0.76 | 4.30* | 0.76 |
| Big City | 55.53 | 0.91 | -3.21* | 0.74 |
| Medium City | 59.29 | 1.79 | 0.55 | 1.66 |
| Small Place | 58.06 | 0.72 | -0.68 | 0.58 |
| 3rd Grade | 52.74 | 0.73 | -6.00* | 0.56 |
| 4th Grade | 60.82 | 0.53 | 2.08* | 0.24 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| Measurement Knowledge | | (16 Exercises) | | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 65.82 | 0.48 | | |
| Northeast | 69.38 | 1.12 | 3.56* | 0.90 |
| Central | 67.76 | 0.77 | 1.94* | 0.69 |
| West | 63.27 | 0.95 | -2.55* | 0.85 |
| Southeast | 62.38 | 0.78 | -3.44* | 0.75 |
| Male | 66.77 | 0.50 | 0.94* | 0.26 |
| Female | 64.89 | 0.58 | -0.93* | 0.25 |
| White | 67.43 | 0.52 | 1.61* | 0.23 |
| Hispanic | 59.30 | 1.39 | -6.52* | 1.80 |
| Black | 58.86 | 0.85 | -6.97* | 0.85 |
| Post High School | 70.21 | 0.62 | 4.38* | 0.35 |
| Grad. High School | 65.69 | 0.68 | -0.13 | 0.51 |
| Not Grad. High School | 59.41 | 1.32 | -6.41* | 1.25 |
| Advantaged Urban | 71.62 | 1.00 | 5.80* | 1.04 |
| Disadvantaged Urban | 60.15 | 1.19 | -5.67* | 1.21 |
| Extreme Rural | 60.40 | 1.55 | -5.42* | 1.58 |
| Fringes | 69.17 | 1.20 | 3.35* | .07 |
| Big City | 64.28 | 0.68 | -1.55* | 0.71 |
| Medium City | 64.90 | 1.12 | -0.92 | 1.18 |
| Small Place | 65.10 | 0.83 | -0.72 | 0.63 |
| 3rd Grade | 58.04 | 0.68 | -7.78* | 0.52 |
| 4th Grade | 68.59 | 0.52 | 2.77* | 0.18 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Mathematical Skills | | (137 Exercises) | |
|-----------------------------|---------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 43.34 | 0.40 | | |
| Northeast | 46.61 | 0.60 | 3.27* | 0.60 |
| Central | 46.16 | 0.86 | 2.82* | 0.66 |
| West | 40.88 | 0.86 | -2.45* | 0.75 |
| Southeast | 39.08 | 0.68 | -4.25* | 0.69 |
| Male | 43.14 | 0.37 | -0.19 | 0.17 |
| Female | 43.54 | 0.49 | 0.20 | 0.17 |
| White | 45.64 | 0.45 | 2.31* | 0.22 |
| Hispanic | 35.44 | 1.08 | -7.89* | 1.05 |
| Black | 32.55 | 0.49 | -10.78* | 0.60 |
| Post High School | 48.38 | 0.54 | 5.04* | 0.33 |
| Grad. High School | 43.86 | 0.55 | 0.53 | 0.44 |
| Not Grad. High School | 35.66 | 0.64 | -7.67* | 0.62 |
| Advantaged urban | 52.26 | 0.93 | 8.93* | 0.97 |
| Disadvantaged urban | 34.45 | 1.07 | -8.88* | 1.03 |
| Extreme Rural | 40.07 | 1.58 | -3.27* | 1.58 |
| Fringes | 46.94 | 0.73 | 3.60* | 0.67 |
| Big City | 40.07 | 0.85 | -3.26* | 0.70 |
| Medium City | 43.46 | 1.21 | 0.13 | 1.24 |
| Small Place | 43.08 | 0.58 | -0.26 | 0.48 |
| 3rd Grade | 32.92 | 0.59 | -10.42* | 0.43 |
| 4th Grade | 46.92 | 0.45 | 3.58* | 0.22 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Computation | | (48 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 35.44 | 0.42 | | |
| Northeast | 39.37 | 0.83 | 3.93* | 0.74 |
| Central | 37.10 | 0.83 | 1.66* | 0.67 |
| West | 33.39 | 0.94 | -2.05* | 0.80 |
| Southeast | 31.57 | 0.62 | -3.87* | 0.66 |
| Male | 34.28 | 0.42 | -1.16* | 0.24 |
| Female | 36.63 | 0.54 | 1.19* | 0.24 |
| White | 37.30 | 0.48 | 1.86* | 0.21 |
| Hispanic | 29.32 | 1.19 | -6.12* | 1.16 |
| Black | 26.65 | 0.64 | -8.79* | 0.70 |
| Post High School | 40.17 | 0.60 | 4.73* | 0.39 |
| Grad. High School | 36.02 | 0.64 | 0.58 | 0.50 |
| Not Grad. High School | 28.01 | 0.82 | -7.43* | 0.77 |
| Advantaged Urban | 44.70 | 1.18 | 9.26* | 1.21 |
| Disadvantaged Urban | 27.32 | 1.13 | -8.12* | 1.11 |
| Extreme Rural | 32.58 | 1.51 | -2.86 | 1.51 |
| Fringes | 39.13 | 0.96 | 3.69* | 0.84 |
| Big City | 32.60 | 0.77 | -2.84* | 0.66 |
| Medium City | 35.09 | 1.13 | -0.35 | 1.17 |
| Small Place | 34.99 | 0.60 | -0.45 | 0.49 |
| 3rd Grade | 23.05 | 0.58 | -12.39* | 0.50 |
| 4th Grade | 39.65 | 0.51 | 4.21* | 0.24 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| Whole Number Computation (20 Exercises) | | | | |
|---|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 52.36 | 0.63 | | |
| Northeast | 57.77 | 1.41 | 5.41* | 1.20 |
| Central | 54.29 | 1.12 | 1.93* | 0.94 |
| West | 50.38 | 1.50 | -1.98 | 1.25 |
| Southeast | 46.66 | 0.98 | -5.70* | 1.05 |
| Male | 49.79 | 0.68 | -2.57* | 0.39 |
| Female | 54.99 | 0.81 | 2.63* | 0.40 |
| White | 54.72 | 0.70 | 2.35* | 0.31 |
| Hispanic | 46.52 | 2.08 | -5.85* | 2.01 |
| Black | 40.12 | 1.16 | -12.24* | 1.13 |
| Post High School | 58.54 | 1.04 | 6.17* | 0.73 |
| Grad. High School | 53.12 | 0.96 | 0.76 | 0.84 |
| Not Grad. High School | 40.90 | 1.32 | -11.47* | 1.22 |
| Advantaged Urban | 64.01 | 1.38 | 11.65* | 1.49 |
| Disadvantaged Urban | 39.70 | 1.84 | -12.66* | 1.78 |
| Extreme Rural | 49.06 | 2.40 | -3.31 | 2.37 |
| Fringes | 57.34 | 1.64 | 4.97* | 1.42 |
| Big City | 48.18 | 1.20 | -4.18* | 1.02 |
| Medium City | 53.30 | 1.81 | 0.94 | 1.80 |
| Small Place | 51.70 | 0.85 | -0.66 | 0.74 |
| 3rd Grade | 33.47 | 0.86 | -18.90* | 0.79 |
| 4th Grade | 58.82 | 0.83 | 6.46* | 0.42 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| Measurement Skills | | (30 Exercises) | | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 52.91 | 0.46 | | |
| Northeast | 55.77 | 0.66 | 2.86* | 0.65 |
| Central | 56.78 | 0.91 | 3.87* | 0.72 |
| West | 49.93 | 0.90 | -2.98* | 0.80 |
| Southeast | 48.28 | 0.97 | -4.63* | 0.88 |
| Male | 53.94 | 0.40 | 1.03* | 0.23 |
| Female | 51.88 | 0.61 | -1.03* | 0.23 |
| White | 55.40 | 0.55 | 2.49* | 0.24 |
| Hispanic | 43.26 | 1.22 | -9.65* | 1.14 |
| Black | 41.60 | 0.60 | -11.31* | 0.77 |
| Post High School | 57.61 | 0.56 | 4.70* | 0.42 |
| Grad. High School | 53.42 | 0.76 | 0.51 | 0.57 |
| Not Grad. High School | 47.08 | 1.04 | -5.83* | 1.00 |
| Advantaged Urban | 61.50 | 1.29 | 8.59* | 1.29 |
| Disadvantaged Urban | 45.45 | 1.51 | -7.46* | 1.50 |
| Extreme Rural | 49.89 | 1.77 | -3.02 | 1.75 |
| Fringes | 56.48 | 0.76 | 3.57* | 0.72 |
| Big City | 50.05 | 1.11 | -2.86* | 0.96 |
| Medium City | 53.49 | 1.61 | 0.58 | 1.63 |
| Small Place | 52.45 | 0.70 | -0.46 | 0.54 |
| 3rd Grade | 44.20 | 0.69 | -8.71* | 0.69 |
| 4th Grade | 56.00 | 0.50 | 3.09* | 0.21 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Making Measurements | | (18 Exercises) | |
|-----------------------|---------------------|----------------|-------------------------------------|----------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 63.59 | 0.51 | | |
| Northeast | 66.07 | 0.84 | 2.48* | 0.80 |
| Central | 68.18 | 0.89 | 4.59* | 0.74 |
| West | 60.45 | 1.10 | -3.14* | 0.95 |
| Southeast | 58.53 | 1.29 | -5.06* | 1.15 |
| Male | 64.51 | 0.47 | 0.92* | 0.30 |
| Female | 62.68 | 0.70 | -0.91* | 0.30 |
| White | 66.42 | 0.58 | 2.83* | 0.26 |
| Hispanic | 53.50 | 1.40 | -10.09* | 1.29 |
| Black | 50.90 | 0.67 | -12.69* | 0.77 |
| Post High School | 68.10 | 0.56 | 4.51* | 0.45 |
| Grad. High School | 64.13 | 0.84 | 0.54 | 0.62 |
| Not Grad. High School | 57.09 | 1.45 | -6.50* | 1.33 |
| Advantaged Urban | 71.67 | 1.05 | 8.08* | 1.07 |
| Disadvantaged Urban | 55.60 | 1.73 | -7.99* | 1.73 |
| Extreme Rural | 61.09 | 1.89 | -2.50 | 1.93 |
| Fringes | 66.87 | 0.91 | 3.28* | 0.85 |
| Big City | 60.31 | 1.15 | -3.28* | 0.99 |
| Medium City | 64.34 | 2.01 | 0.75 | 1.93 |
| Small Place | 63.36 | 0.76 | -0.23 | 0.60 |
| 3rd Grade | 55.14 | 0.84 | -8.45* | 0.61 |
| 4th Grade | 66.66 | 0.54 | 3.07* | 0.24 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

Reading Graphs and Tables

(16 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|--------------------------|--------------------|-------------------|---|-------------------|
| Nation | 58.91 | 0.72 | | |
| Northeast | 61.86 | 1.33 | 2.94* | 1.21 |
| Central | 63.63 | 1.64 | 4.72* | 1.22 |
| West | 55.91 | 1.24 | -3.01* | 1.16 |
| Southeast | 53.26 | 1.42 | -5.66* | 1.39 |
| Male | 57.53 | 0.82 | -1.39* | 0.32 |
| Female | 60.34 | 0.74 | 1.43* | 0.33 |
| White | 62.22 | 0.77 | 3.31* | 0.39 |
| Hispanic | 47.54 | 1.82 | -11.37* | 1.86 |
| Black | 43.73 | 1.18 | -15.18* | 1.18 |
| Post High School | 66.01 | 0.86 | 7.10* | 0.57 |
| Grad. High School | 59.25 | 1.01 | 0.33 | 0.82 |
| Not Grad. High School | 45.57 | 1.18 | -13.34* | 1.14 |
| Advantaged Urban | 68.14 | 1.62 | 9.23* | 1.44 |
| Disadvantaged Urban | 44.68 | 1.81 | -14.23* | 1.68 |
| Extreme Rural | 53.38 | 2.66 | -5.53* | 2.66 |
| Fringes | 63.10 | 1.11 | 4.19* | 0.99 |
| Big City | 53.52 | 1.50 | -5.39* | 1.17 |
| Medium City | 58.53 | 2.12 | -0.38 | 2.14 |
| Small Place | 59.45 | 1.01 | 0.53 | 0.76 |
| 3rd Grade | 46.65 | 1.37 | -12.26* | 1.00 |
| 4th Grade | 63.07 | 0.74 | 4.51* | 0.43 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Geometric Manipulation | | (15 Exercises) | |
|-----------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 44.44 | 0.47 | | |
| Northeast | 45.94 | 0.82 | 1.50 | 0.77 |
| Central | 46.89 | 0.87 | 2.45* | 0.68 |
| West | 43.75 | 0.96 | -0.69 | 0.84 |
| Southeast | 40.52 | 0.85 | -3.91* | 0.79 |
| Male | 45.32 | 0.61 | 0.88* | 0.33 |
| Female | 43.56 | 0.53 | -0.88* | 0.33 |
| White | 46.77 | 0.50 | 2.34* | 0.25 |
| Hispanic | 37.10 | 0.96 | -7.34* | 0.99 |
| Black | 33.63 | 0.87 | -10.81* | 0.85 |
| Post High School | 48.58 | 0.80 | 4.14* | 0.57 |
| Grad. High School | 44.27 | 0.64 | -0.16 | 0.55 |
| Not Grad. High School | 37.83 | 0.87 | -6.61* | 0.93 |
| Advantaged Urban | 51.39 | 0.97 | 6.95* | 0.98 |
| Disadvantaged Urban | 37.71 | 1.42 | -6.73* | 1.38 |
| Extreme Rural | 42.01 | 1.50 | -2.42 | 1.48 |
| Fringes | 47.77 | 0.75 | 3.33* | 0.67 |
| Big City | 41.18 | 0.85 | -3.25* | 0.77 |
| Medium City | 44.73 | 0.95 | 0.30 | 0.97 |
| Small Place | 44.20 | 0.68 | -0.24 | 0.48 |
| 3rd Grade | 38.98 | 0.64 | -5.46* | 0.52 |
| 4th Grade | 46.43 | 0.54 | 1.99* | 0.19 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Algebraic Manipulation | | (19 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 39.36 | 0.55 | | |
| Northeast | 45.08 | 0.79 | 5.72* | 0.81 |
| Central | 42.19 | 1.13 | 2.83* | 0.89 |
| West | 34.68 | 1.04 | -4.68* | 0.93 |
| Southeast | 34.96 | 1.01 | -4.40* | 0.90 |
| Male | 38.72 | 0.53 | -0.64 | 0.34 |
| Female | 40.00 | 0.75 | 0.64 | 0.35 |
| White | 41.76 | 0.59 | 2.40* | 0.28 |
| Hispanic | 31.99 | 2.03 | -7.37* | 1.90 |
| Black | 27.57 | 0.70 | -11.79* | 0.73 |
| Post High School | 44.94 | 0.68 | 5.58* | 0.48 |
| Grad. High School | 40.23 | 0.68 | 0.87 | 0.50 |
| Not Grad. High School | 31.05 | 1.07 | -8.31* | 0.94 |
| Advantaged Urban | 50.11 | 1.69 | 10.75* | 1.78 |
| Disadvantaged Urban | 28.85 | 1.70 | -10.51* | 1.64 |
| Extreme Rural | 35.32 | 2.11 | -4.04* | 1.98 |
| Fringes | 43.18 | 1.05 | 3.82* | 1.04 |
| Big City | 36.61 | 1.18 | -2.75* | 1.06 |
| Medium City | 40.21 | 1.78 | 0.85 | 1.81 |
| Small Place | 38.67 | 0.91 | -0.69 | 0.68 |
| 3rd Grade | 27.16 | 0.78 | -12.20* | 0.62 |
| 4th Grade | 43.56 | 0.60 | 4.20* | 0.33 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Solving Equations | | (10 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 44.52 | 0.73 | | |
| Northeast | 51.12 | 1.24 | 6.60* | 1.16 |
| Central | 46.70 | 1.35 | 2.18 | 1.11 |
| West | 39.32 | 1.53 | -5.20* | 1.30 |
| Southeast | 40.54 | 1.28 | -3.98* | 1.18 |
| Male | 43.59 | 0.70 | -0.93* | 0.39 |
| Female | 45.45 | 0.94 | 0.93 | 0.40 |
| White | 46.72 | 0.81 | 2.20* | 0.32 |
| Hispanic | 36.06 | 2.40 | -8.45* | 2.19 |
| Black | 34.32 | 1.37 | -10.20* | 1.41 |
| Post High School | 49.42 | 0.86 | 4.90* | 0.48 |
| Grad. High School | 46.31 | 0.93 | 1.79* | 0.63 |
| Not Grad. High School | 35.27 | 1.25 | -9.25* | 1.04 |
| Advantaged Urban | 55.97 | 1.60 | 11.45* | 1.76 |
| Disadvantaged Urban | 35.46 | 1.84 | -9.06* | 1.77 |
| Extreme Rural | 39.46 | 2.74 | -5.06* | 2.50 |
| Fringes | 48.81 | 1.40 | 4.30* | 1.42 |
| Big City | 42.71 | 1.15 | -1.81 | 1.12 |
| Medium City | 46.13 | 2.63 | 1.62 | 2.54 |
| Small Place | 43.09 | 1.21 | -1.43 | 0.82 |
| 3rd Grade | 30.66 | 1.18 | -13.85* | 0.90 |
| 4th Grade | 49.30 | 0.76 | 4.78* | 0.47 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

Mathematical Understanding (44 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 39.60 | 0.42 | | |
| Northeast | 43.56 | 0.49 | 3.96* | 0.54 |
| Central | 41.99 | 0.94 | 2.39* | 0.71 |
| West | 36.03 | 0.81 | -3.57* | 0.73 |
| Southeast | 36.37 | 0.71 | -3.23* | 0.68 |
| Male | 40.14 | 0.44 | 0.54* | 0.21 |
| Female | 39.07 | 0.50 | -0.53* | 0.21 |
| White | 41.86 | 0.48 | 2.26* | 0.24 |
| Hispanic | 31.44 | 0.88 | -8.16* | 0.86 |
| Black | 29.31 | 0.67 | -10.29* | 0.70 |
| Post High School | 45.15 | 0.50 | 5.55* | 0.39 |
| Grad. High School | 39.55 | 0.67 | -0.05 | 0.53 |
| Not Grad. High School | 32.50 | 0.72 | -7.10* | 0.67 |
| Advantaged Urban | 49.47 | 1.58 | 9.87* | 1.56 |
| Disadvantaged Urban | 31.58 | 1.23 | -8.03* | 1.23 |
| Extreme Rural | 33.95 | 1.61 | -5.66* | 1.53 |
| Fringes | 43.62 | 1.00 | 4.02* | 0.95 |
| Big City | 37.15 | 1.01 | -2.45* | 0.91 |
| Medium City | 41.01 | 1.61 | 1.41 | 1.57 |
| Small Place | 38.44 | 0.62 | -1.16* | 0.53 |
| 3rd Grade | 30.45 | 0.77 | -9.15* | 0.54 |
| 4th Grade | 42.81 | 0.46 | 3.21* | 0.24 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

Mathematical Applications (44 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 37.75 | 0.41 | | |
| Northeast | 41.67 | 0.57 | 3.92* | 0.55 |
| Central | 40.02 | 0.84 | 2.27* | 0.66 |
| West | 35.16 | 0.87 | -2.59* | 0.76 |
| Southeast | 33.72 | 0.77 | -4.03* | 0.76 |
| Male | 37.93 | 0.44 | 0.18 | 0.21 |
| Female | 37.56 | 0.47 | -0.18 | 0.21 |
| White | 40.10 | 0.44 | 2.35* | 0.24 |
| Hispanic | 29.51 | 1.51 | -8.23* | 1.42 |
| Black | 27.08 | 0.59 | -10.66* | 0.62 |
| Post High School | 43.73 | 0.56 | 5.98* | 0.39 |
| Grad. High School | 37.52 | 0.56 | -0.23 | 0.41 |
| Not Grad. High School | 29.98 | 0.72 | -7.77* | 0.74 |
| Advantaged Urban | 47.11 | 0.99 | 9.36* | 1.07 |
| Disadvantaged Urban | 30.04 | 1.19 | -7.70* | 1.15 |
| Extreme Rural | 33.53 | 1.17 | -4.22* | 1.24 |
| Fringes | 42.13 | 0.78 | 4.38* | 0.75 |
| Big City | 35.03 | 0.92 | -2.72* | 0.81 |
| Medium City | 37.52 | 1.24 | -0.22 | 1.29 |
| Small Place | 36.88 | 0.68 | -0.87 | 0.54 |
| 3rd Grade | 27.58 | 0.56 | -10.17* | 0.44 |
| 4th Grade | 41.22 | 0.43 | 3.48* | 0.20 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | Routine Problems | | (33 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 36.66 | 0.47 | | |
| Northeast | 40.98 | 0.79 | 4.32* | 0.70 |
| Central | 39.24 | 0.92 | 2.58* | 0.74 |
| West | 33.86 | 0.98 | -2.81* | 0.85 |
| Southeast | 32.08 | 0.89 | -4.58* | 0.87 |
| Male | 36.96 | 0.52 | 0.30 | 0.25 |
| Female | 36.36 | 0.54 | -0.30 | 0.25 |
| White | 39.38 | 0.52 | 2.72* | 0.27 |
| Hispanic | 27.84 | 1.54 | -8.82* | 1.49 |
| Black | 24.03 | 0.64 | -12.63* | 0.68 |
| Post High School | 43.57 | 0.63 | 6.90* | 0.44 |
| Grad. High School | 36.66 | 0.70 | -0.01 | 0.49 |
| Not Grad. High School | 27.79 | 0.85 | -8.87* | 0.88 |
| Advantaged Urban | 47.65 | 1.11 | 10.99* | 1.18 |
| Disadvantaged Urban | 27.77 | 1.28 | -8.89* | 1.27 |
| Extreme Rural | 32.13 | 1.40 | -4.53* | 1.50 |
| Fringes | 41.53 | 0.98 | 4.87* | 0.94 |
| Big City | 33.68 | 1.05 | -2.98* | 0.94 |
| Medium City | 35.97 | 1.48 | -0.70 | 1.53 |
| Small Place | 35.77 | 0.77 | -0.90 | 0.63 |
| 3rd Grade | 24.97 | 0.63 | -11.69* | 0.53 |
| 4th Grade | 40.64 | 0.51 | 3.98* | 0.24 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 6 (Continued). Age 9 -- Mean Performance Percentages
1978

| | One-Step Word Problems | | (18 Exercises) | |
|----------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 44.43 | 0.59 | | |
| Northeast | 49.23 | 1.22 | 4.80* | 1.02 |
| Central | 47.13 | 1.03 | 2.70* | 0.87 |
| West | 41.65 | 1.15 | -2.78* | 1.02 |
| Southeast | 39.22 | 1.28 | -5.21* | 1.19 |
| Male | 44.29 | 0.70 | -0.14 | 0.30 |
| Female | 44.57 | 0.63 | 0.14 | 0.32 |
| White | 47.41 | 0.68 | 2.98* | 0.32 |
| Hispanic | 35.61 | 1.68 | -8.82* | 1.67 |
| Black | 30.10 | 0.96 | -14.33* | 0.96 |
| Post High School | 51.38 | 0.71 | 6.95* | 0.50 |
| Grad. High School | 44.78 | 0.86 | 0.35 | 0.59 |
| Not Grad. School | 33.47 | 1.10 | -10.96* | 1.04 |
| Advantaged Urban | 56.93 | 1.40 | 12.50* | 1.44 |
| Disadvantaged Urban | 33.47 | 1.68 | -10.96* | 1.62 |
| Extreme Rural | 38.69 | 1.78 | -5.74* | 1.91 |
| Fringes | 49.83 | 1.24 | 5.40* | 1.15 |
| Big City | 40.98 | 1.20 | -3.45* | 1.11 |
| Medium City | 43.36 | 1.58 | -1.07 | 1.60 |
| Small Place | 43.60 | 0.96 | -0.83 | 0.73 |
| 3rd Grade | 30.98 | 0.81 | -13.45* | 0.68 |
| 4th Grade | 49.05 | 0.60 | 4.62* | 0.26 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7. Age 13 -- Mean Performance Percentages
1977

| | Mathematical Knowledge | | (147 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 66.87 | 0.52 | | |
| Northeast | 70.40 | 0.86 | 3.53* | 0.78 |
| Central | 69.47 | 1.02 | 2.60* | 0.82 |
| West | 65.01 | 1.02 | -1.87* | 0.90 |
| Southeast | 61.87 | 1.19 | -5.00* | 1.08 |
| Male | 66.96 | 0.53 | 0.09 | 0.19 |
| Female | 66.79 | 0.58 | -0.08 | 0.20 |
| White | 69.74 | 0.45 | 2.86* | 0.25 |
| Hispanic | 55.96 | 0.64 | -10.92* | 0.75 |
| Black | 52.82 | 0.72 | -14.05* | 0.86 |
| Post High School | 72.76 | 0.49 | 5.89* | 0.28 |
| Grad. High School | 66.26 | 0.55 | -0.61 | 0.36 |
| Not Grad. High School | 59.37 | 0.63 | -7.50* | 0.59 |
| Advantaged Urban | 74.16 | 0.66 | 7.29* | 0.74 |
| Disadvantaged Urban | 56.58 | 1.66 | -10.29* | 1.64 |
| Extreme Rural | 62.50 | 2.00 | -4.37* | 1.93 |
| Fringes | 70.44 | 0.84 | 3.56* | 0.71 |
| Big City | 64.35 | 1.12 | -2.53* | 1.03 |
| Medium City | 70.74 | 1.91 | 3.87* | 1.89 |
| Small Place | 65.67 | 0.84 | -1.20 | 0.69 |
| 7th Grade | 58.10 | 0.65 | -8.77* | 0.41 |
| 8th Grade | 70.75 | 0.48 | 3.87* | 0.19 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Numbers and Numeration | | (86 Exercises) | |
|-----------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 71.20 | 0.54 | | |
| Northeast | 74.59 | 0.82 | 3.39* | 0.77 |
| Central | 73.85 | 0.90 | 2.65* | 0.78 |
| West | 69.57 | 1.16 | -1.63 | 1.00 |
| Southeast | 65.96 | 1.33 | -5.24* | 1.17 |
| Male | 70.63 | 0.57 | -0.57* | 0.21 |
| Female | 71.79 | 0.59 | 0.59* | 0.21 |
| White | 74.11 | 0.47 | 2.91* | 0.26 |
| Hispanic | 69.98 | 0.73 | -11.22* | 0.80 |
| Black | 66.75 | 0.75 | -14.45* | 0.86 |
| Post High School | 77.01 | 0.55 | 5.81* | 0.33 |
| Grad. High School | 70.86 | 0.55 | -0.34 | 0.39 |
| Not Grad. High School | 63.77 | 0.69 | -7.42* | 0.62 |
| Advantaged Urban | 78.65 | 0.72 | 7.46* | 0.84 |
| Disadvantaged Urban | 60.44 | 1.81 | -10.75* | 1.79 |
| Extreme Rural | 66.55 | 1.84 | -4.65* | 1.77 |
| Fringes | 75.36 | 0.94 | 4.16* | 0.78 |
| Big City | 68.06 | 1.12 | -3.14* | 1.06 |
| Medium City | 75.49 | 1.85 | 4.29* | 1.85 |
| Small Place | 69.95 | 0.90 | -1.25 | 0.74 |
| 7th Grade | 61.84 | 0.67 | -9.36* | 0.44 |
| 8th Grade | 75.36 | 0.51 | 4.16* | 0.23 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Place Value | | (16 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 70.86 | 0.84 | | |
| Northeast | 74.50 | 1.40 | 3.64* | 1.29 |
| Central | 75.50 | 1.25 | 4.64* | 1.15 |
| West | 68.99 | 2.02 | -1.87 | 1.68 |
| Southeast | 63.28 | 2.05 | -7.58* | 1.80 |
| Male | 71.03 | 0.94 | 0.18 | 0.42 |
| Female | 70.68 | 0.95 | -0.18 | 0.44 |
| White | 75.13 | 0.69 | 4.27* | 0.43 |
| Hispanic | 52.36 | 2.28 | -18.50* | 2.06 |
| Black | 50.86 | 1.34 | -20.00* | 1.43 |
| Post High School | 78.72 | 0.77 | 7.86* | 0.46 |
| Grad. High School | 70.75 | 0.93 | -0.11 | 0.54 |
| Not Grad. High School | 60.04 | 1.26 | -10.32* | 1.03 |
| Advantaged Urban | 79.46 | 1.35 | 8.61* | 1.52 |
| Disadvantaged Urban | 55.91 | 2.02 | -14.95* | 1.96 |
| Extreme Rural | 62.69 | 3.21 | -8.17* | 2.94 |
| Pringes | 75.66 | 1.09 | 4.80* | 0.96 |
| Big City | 66.98 | 1.53 | -3.88* | 1.41 |
| Medium City | 77.68 | 3.04 | 6.82* | 3.06 |
| Small Place | 69.11 | 1.32 | -1.75 | 0.99 |
| 7th Grade | 59.24 | 1.07 | -11.62* | 0.75 |
| 8th Grade | 76.10 | 0.89 | 5.24* | 0.39 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Basic Facts | | (23 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 90.80 | 0.47 | | |
| Northeast | 92.66 | 0.78 | 1.86* | 0.70 |
| Central | 92.76 | 0.86 | 1.96* | 0.71 |
| West | 89.97 | 0.62 | -0.84 | 0.65 |
| Southeast | 87.17 | 1.34 | -3.63* | 1.14 |
| Male | 89.77 | 0.55 | -1.03* | 0.24 |
| Female | 91.88 | 0.50 | 1.08* | 0.24 |
| White | 92.81 | 0.40 | 2.01* | 0.25 |
| Hispanic | 83.61 | 1.40 | -7.19* | 1.41 |
| Black | 80.60 | 1.56 | -10.20* | 1.43 |
| Post High School | 94.09 | 0.40 | 3.29* | 0.33 |
| Grad. High School | 91.28 | 0.55 | 0.47 | 0.37 |
| Not Grad. High School | 86.66 | 0.77 | -4.14* | 0.74 |
| Advantaged Urban | 95.00 | 0.54 | 4.20* | 0.65 |
| Disadvantaged Urban | 82.47 | 1.66 | -8.33* | 1.69 |
| Extreme Rural | 88.50 | 1.84 | -2.30 | 1.76 |
| Fringes | 93.59 | 0.96 | 2.79* | 0.82 |
| Big City | 88.01 | 1.00 | -2.80* | 0.92 |
| Medium City | 93.57 | 1.31 | 2.76* | 1.32 |
| Small Place | 90.29 | 0.73 | -0.52 | 0.61 |
| 7th Grade | 84.97 | 0.68 | -5.83* | 0.44 |
| 8th Grade | 93.42 | 0.42 | 2.62* | 0.22 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Ordering | | (15 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 54.04 | 0.62 | | |
| Northeast | 57.42 | 0.73 | 3.38* | 0.83 |
| Central | 56.64 | 1.45 | 2.60* | 1.12 |
| West | 52.88 | 1.32 | -1.16 | 1.12 |
| Southeast | 48.41 | 1.13 | -5.63* | 1.08 |
| Male | 54.94 | 0.69 | 0.91* | 0.32 |
| Female | 53.15 | 0.72 | -0.89* | 0.32 |
| White | 56.46 | 0.66 | 2.42* | 0.26 |
| Hispanic | 46.74 | 1.06 | -7.30* | 1.11 |
| Black | 40.72 | 0.67 | -13.32* | 0.91 |
| Post High School | 59.62 | 0.87 | 5.59* | 0.54 |
| Grad. High School | 53.07 | 0.74 | -0.97 | 0.59 |
| Not Grad. High School | 48.02 | 0.93 | -6.02* | 0.78 |
| Advantaged Urban | 59.17 | 1.45 | 5.13* | 1.43 |
| Disadvantaged Urban | 44.32 | 2.26 | -9.72* | 2.18 |
| Extreme Rural | 49.57 | 1.92 | -4.47* | 1.83 |
| Fringes | 57.95 | 1.30 | 3.91* | 1.07 |
| Big City | 50.09 | 1.04 | -3.95* | 1.02 |
| Medium City | 59.06 | 2.40 | 5.02* | 2.32 |
| Small Place | 53.22 | 0.93 | -0.82 | 0.81 |
| 7th Grade | 45.41 | 0.79 | -8.63* | 0.53 |
| 8th Grade | 57.76 | 0.63 | 3.72* | 0.23 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | | Number and Operation Properties (18 Exercises) | | |
|-----------------------------|--------------------|--|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 63.26 | 0.69 | | |
| Northeast | 66.62 | 1.24 | 3.37* | 1.08 |
| Central | 65.47 | 0.79 | 2.21* | 0.85 |
| West | 61.36 | 1.65 | -1.89 | 1.38 |
| Southeast | 58.90 | 1.74 | -4.35* | 1.49 |
| Male | 62.28 | 0.74 | -0.98* | 0.37 |
| Female | 64.28 | 0.83 | 1.02* | 0.39 |
| White | 66.07 | 0.64 | 2.81* | 0.34 |
| Hispanic | 52.04 | 1.82 | -11.21* | 1.77 |
| Black | 49.22 | 1.08 | -14.03* | 1.09 |
| Post High School | 69.16 | 0.77 | 5.90* | 0.55 |
| Grad. High School | 62.73 | 0.82 | -0.52 | 0.63 |
| Not Grad. High School | 55.12 | 1.26 | -8.14* | 1.05 |
| Advantaged Urban | 72.69 | 1.51 | 9.43* | 1.56 |
| Disadvantaged Urban | 54.21 | 2.86 | -9.04* | 2.85 |
| Extreme Rural | 58.03 | 1.70 | -5.22* | 1.68 |
| Fringes | 68.03 | 1.51 | 4.78* | 1.36 |
| Big City | 61.45 | 1.51 | -1.81 | 1.40 |
| Medium City | 67.25 | 1.40 | 3.99* | 1.52 |
| Small Place | 61.19 | 1.18 | -2.06* | 0.90 |
| 7th Grade | 53.25 | 1.01 | -10.00* | 0.78 |
| 8th Grade | 67.74 | 0.72 | 4.49* | 0.38 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Geometry Knowledge | | | (44 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 57.30 | 0.58 | | |
| Northeast | 60.29 | 1.15 | 2.99* | 1.00 |
| Central | 59.78 | 1.25 | 2.48* | 0.98 |
| West | 55.28 | 0.90 | -2.02* | 0.88 |
| Southeast | 53.36 | 1.34 | -3.94* | 1.21 |
| Male | 57.45 | 0.59 | 0.15 | 0.26 |
| Female | 57.14 | 0.69 | -0.16 | 0.26 |
| White | 59.83 | 0.54 | 2.53* | 0.27 |
| Hispanic | 48.16 | 1.00 | -9.14* | 1.06 |
| Black | 44.87 | 0.86 | -12.43* | 0.95 |
| Post High School | 63.02 | 0.53 | 5.72* | 0.29 |
| Grad. High School | 56.39 | 0.72 | -0.91* | 0.37 |
| Not Grad. High School | 49.78 | 0.78 | -7.52* | 0.75 |
| Advantaged Urban | 64.66 | 0.90 | 7.36* | 0.80 |
| Disadvantaged Urban | 48.28 | 1.33 | -9.02* | 1 |
| Extreme Rural | 52.84 | 2.23 | -4.46* | 2.22 |
| Fringes | 59.89 | 0.92 | 2.59* | 0.79 |
| Big City | 56.06 | 1.21 | -1.24 | 1.02 |
| Medium City | 61.12 | 1.91 | 3.82* | 1.87 |
| Small Place | 55.88 | 0.81 | -1.42* | 0.65 |
| 7th Grade | 49.73 | 0.67 | -7.57* | 0.48 |
| 8th Grade | 60.59 | 0.61 | 3.29* | 0.21 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Measurement Knowledge | | (17 Exercises) | |
|-----------------------------|-----------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 69.79 | 0.71 | | |
| Northeast | 75.40 | 1.20 | 5.61* | 1.11 |
| Central | 72.43 | 1.39 | 2.64* | 1.12 |
| West | 67.10 | 1.48 | -2.69* | 1.28 |
| Southeast | 63.26 | 1.39 | -6.53* | 1.31 |
| Male | 73.02 | 0.76 | 3.23* | 0.33 |
| Female | 66.50 | 0.82 | -3.28* | 0.33 |
| White | 73.26 | 0.66 | 3.47* | 0.36 |
| Hispanic | 55.81 | 2.13 | -13.98* | 2.14 |
| Black | 53.57 | 1.53 | -16.22* | 1.55 |
| Post High School | 76.53 | 0.77 | 6.74* | 0.46 |
| Grad. High School | 68.58 | 0.88 | -1.20 | 0.63 |
| Not Grad. High School | 61.94 | 1.20 | -7.85* | 1.04 |
| Advantaged Urban | 76.02 | 1.27 | 6.24* | 1.07 |
| Disadvantaged Urban | 58.55 | 2.67 | -11.24* | 2.61 |
| Extreme Rural | 67.06 | 3.00 | -2.72 | 2.87 |
| Fringes | 72.87 | 1.25 | 3.08* | 1.09 |
| Big City | 66.99 | 1.65 | -2.79* | 1.44 |
| Medium City | 71.62 | 2.97 | 1.83 | 2.90 |
| Small Place | 69.38 | 1.14 | -0.40 | 0.90 |
| 7th Grade | 60.84 | 1.04 | -8.95* | 0.69 |
| 8th Grade | 73.71 | 0.64 | 3.92* | 0.24 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Mathematical Skills | | (272 Exercises) | | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 51.88 | 0.65 | | |
| Northeast | 56.85 | 0.98 | 4.97* | 0.90 |
| Central | 54.46 | 1.18 | 2.58* | 0.99 |
| West | 50.09 | 1.33 | -1.79 | 1.15 |
| Southeast | 45.34 | 1.53 | -6.54* | 1.36 |
| Male | 51.33 | 0.68 | -0.55* | 0.18 |
| Female | 52.44 | 0.66 | 0.56* | 0.18 |
| White | 55.20 | 0.54 | 3.32* | 0.31 |
| Hispanic | 39.92 | 0.85 | -11.96* | 0.31 |
| Black | 35.10 | 0.81 | -16.78* | 0.91 |
| Post High School | 58.77 | 0.64 | 6.89* | 0.31 |
| Grad. High School | 50.99 | 0.61 | -0.89* | 0.42 |
| Not Grad. High School | 42.96 | 0.66 | -8.92* | 0.61 |
| Advantaged Urban | 60.86 | 1.05 | 8.97* | 1.06 |
| Disadvantaged Urban | 39.07 | 1.72 | -12.82* | 1.66 |
| Extreme Rural | 47.16 | 2.21 | -4.73* | 2.12 |
| Fringes | 56.66 | 1.06 | 4.78* | 0.87 |
| Big City | 48.82 | 1.42 | -3.06* | 1.23 |
| Medium City | 57.07 | 2.59 | 5.19* | 2.53 |
| Small Place | 50.06 | 0.97 | -1.82* | 0.98 |
| 7th Grade | 40.23 | 0.66 | -11.65* | 0.46 |
| 8th Grade | 56.92 | 0.64 | 5.04* | 0.24 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Computation | | (129 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 51.68 | 0.74 | | |
| Northeast | 57.91 | 0.95 | 6.23* | 0.94 |
| Central | 53.72 | 1.32 | 2.04 | 1.12 |
| West | 49.64 | 1.62 | -2.04 | 1.38 |
| Southeast | 44.79 | 1.75 | -6.89* | 1.55 |
| Male | 49.94 | 0.78 | -1.74* | 0.24 |
| Female | 53.44 | 0.77 | 1.76* | 0.23 |
| White | 54.97 | 0.63 | 3.29* | 0.31 |
| Hispanic | 39.13 | 1.14 | -12.55* | 0.99 |
| Black | 35.26 | 0.94 | -16.42* | 0.98 |
| Post High School | 58.96 | 0.76 | 7.28* | 0.33 |
| Grad. High School | 50.73 | 0.64 | -0.95 | 0.48 |
| Not Grad. High School | 42.42 | 0.79 | -9.26* | 0.71 |
| Advantaged Urban | 61.29 | 1.38 | 9.61* | 1.33 |
| Disadvantaged Urban | 38.89 | 1.91 | -12.79* | 1.82 |
| Extreme Rural | 46.73 | 2.65 | -4.95 | 2.53 |
| Fringes | 57.20 | 1.28 | 5.52* | 1.05 |
| Big City | 48.91 | 1.64 | -2.77* | 1.38 |
| Medium City | 56.96 | 3.03 | 5.28 | 2.97 |
| Small Place | 49.30 | 1.04 | -2.38* | 0.98 |
| 7th Grade | 37.12 | 0.71 | -14.56* | 0.53 |
| 8th Grade | 57.91 | 0.76 | 6.13* | 0.29 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Whole Number Computation | | (20 Exercises) | | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 82.67 | 0.49 | | |
| Northeast | 85.52 | 0.69 | 2.85* | 0.67 |
| Central | 84.65 | 1.03 | 1.97* | 0.82 |
| West | 82.10 | 0.86 | -0.57 | 0.78 |
| Southeast | 77.81 | 1.25 | -4.87* | 1.11 |
| Male | 81.04 | 0.38 | -1.63* | 0.22 |
| Female | 84.33 | 0.49 | 1.66* | 0.23 |
| White | 85.06 | 0.42 | 2.39* | 0.27 |
| Hispanic | 76.39 | 1.05 | -6.28* | 1.04 |
| Black | 69.49 | 1.10 | -13.18* | 1.10 |
| Post High School | 86.64 | 0.43 | 3.97* | 0.28 |
| Grad. High School | 82.68 | 0.62 | 0.01 | 0.46 |
| Not Grad. High School | 77.33 | 1.02 | -5.34* | 0.99 |
| Advantaged Urban | 86.63 | 0.47 | 3.96* | 0.61 |
| Disadvantaged Urban | 73.39 | 1.91 | -9.28* | 1.89 |
| Extreme Rural | 80.32 | 1.49 | -2.36 | 1.52 |
| Fringes | 85.88 | 0.54 | 3.21* | 0.53 |
| Big City | 79.91 | 1.02 | -2.76* | 0.87 |
| Medium City | 86.50 | 1.63 | 3.83* | 1.56 |
| Small Place | 81.82 | 0.74 | -0.86 | 0.60 |
| 7th Grade | 75.39 | 0.86 | -7.28* | 0.59 |
| 8th Grade | 85.96 | 0.42 | 3.29* | 0.21 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

Computation With Fractions (34 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 51.40 | 0.94 | | |
| Northeast | 58.98 | 1.01 | -7.59* | 1.12 |
| Central | 53.30 | 1.59 | 1.91 | 1.38 |
| West | 48.82 | 2.09 | -2.58 | 1.76 |
| Southeast | 43.89 | 2.46 | -7.50* | 2.11 |
| Male | 49.51 | 0.98 | -1.89* | 0.31 |
| Female | 53.30 | 0.99 | 1.91* | 0.31 |
| White | 55.42 | 0.82 | 4.02* | 0.36 |
| Hispanic | 34.56 | 1.36 | -16.84* | 1.18 |
| Black | 31.96 | 1.14 | -19.44* | 1.32 |
| Post High School | 60.00 | 0.96 | 8.60* | 0.52 |
| Grad. High School | 50.60 | 0.95 | -0.79 | 0.66 |
| Not Grad. High School | 39.14 | 1.20 | -12.25* | 1.04 |
| Advantaged Urban | 61.61 | 1.43 | 10.22* | 1.56 |
| Disadvantaged Urban | 37.52 | 2.29 | -13.88* | 2.20 |
| Extreme Rural | 46.18 | 3.23 | -5.21 | 2.96 |
| Fringes | 57.44 | 1.54 | 6.05* | 1.29 |
| Big City | 47.68 | 1.70 | -3.71* | 1.54 |
| Medium City | 58.89 | 2.98 | 7.50* | 2.98 |
| Small Place | 48.69 | 1.55 | -2.70* | 1.27 |
| 7th Grade | 34.20 | 1.10 | -17.19* | 0.70 |
| 8th Grade | 58.67 | 0.93 | 7.28* | 0.41 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

Computation With Decimals (18 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 54.70 | 1.02 | | |
| Northeast | 61.60 | 1.30 | 6.90* | 1.30 |
| Central | 58.57 | 1.60 | 3.87* | 1.44 |
| West | 52.32 | 2.38 | -2.38 | 1.98 |
| Southeast | 45.04 | 2.50 | -9.66* | 2.17 |
| Male | 50.85 | 1.09 | -3.85* | 0.44 |
| Female | 58.59 | 1.14 | 3.89* | 0.43 |
| White | 58.84 | 0.87 | 4.14* | 0.46 |
| Hispanic | 42.01 | 2.10 | -12.69* | 1.80 |
| Black | 32.95 | 1.67 | -21.75* | 1.55 |
| Post High School | 63.01 | 1.03 | 8.31* | 0.56 |
| Grad. High School | 54.23 | 1.09 | -0.47 | 0.57 |
| Not Grad. High School | 44.36 | 1.30 | -10.34* | 1.14 |
| Advantaged Urban | 65.81 | 2.25 | 11.11* | 2.10 |
| Disadvantaged Urban | 37.08 | 1.89 | -17.62* | 1.86 |
| Extreme Rural | 47.92 | 4.33 | -6.78 | 4.14 |
| Fringes | 60.49 | 1.98 | 5.79* | 1.65 |
| Big City | 52.53 | 2.51 | -2.17 | 2.07 |
| Medium City | 58.60 | 2.49 | 3.90 | 2.65 |
| Small Place | 52.16 | 1.37 | -2.54* | 1.14 |
| 7th Grade | 35.90 | 1.14 | -18.80* | 0.90 |
| 8th Grade | 62.67 | 0.99 | 7.97* | 0.47 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | | Computation With Integers | | (22 Exercises) |
|-----------------------------|--------------------|---------------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 38.22 | 0.96 | | |
| Northeast | 43.22 | 1.44 | 5.00* | 1.42 |
| Central | 40.51 | 2.09 | 2.29 | 1.66 |
| West | 34.99 | 1.97 | -3.23 | 1.71 |
| Southeast | 33.75 | 2.04 | -4.46* | 1.81 |
| Male | 37.11 | 1.01 | -1.11* | 0.37 |
| Female | 39.36 | 1.06 | 1.14* | 0.37 |
| White | 40.54 | 1.02 | 2.32* | 0.34 |
| Hispanic | 27.13 | 1.94 | -11.09* | 1.85 |
| Black | 27.54 | 1.33 | -10.67* | 1.36 |
| Post High School | 45.25 | 1.25 | 7.03* | 0.53 |
| Grad. High School | 36.80 | 0.90 | -1.42 | 0.71 |
| Not Grad. High School | 29.84 | 0.87 | -8.38* | 0.82 |
| Advantaged Urban | 50.17 | 3.21 | 11.96* | 2.84 |
| Disadvantaged Urban | 28.54 | 1.67 | -9.68* | 1.72 |
| Extreme Rural | 31.73 | 2.64 | -6.49* | 2.55 |
| Fringes | 45.83 | 1.85 | 7.61* | 1.54 |
| Big City | 36.87 | 2.30 | -1.35 | 1.82 |
| Medium City | 40.60 | 2.79 | 2.38 | 2.90 |
| Small Place | 34.56 | 1.26 | -3.66* | 1.10 |
| 7th Grade | 22.47 | 0.54 | -15.74* | 0.82 |
| 8th Grade | 44.34 | 1.22 | 6.12* | 0.42 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (continued). Age 13 -- Mean Performance Percentages
1977

| | Measurement Skills | | (32 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 54.75 | 0.65 | | |
| Northeast | 58.64 | 1.12 | 3.89* | 1.00 |
| Central | 58.83 | 1.24 | 4.08* | 1.01 |
| West | 53.42 | 1.24 | -1.33 | 1.10 |
| Southeast | 46.86 | 1.41 | -7.89* | 1.30 |
| Male | 57.11 | 0.73 | 2.36* | 0.26 |
| Female | 52.36 | 0.68 | -2.40* | 0.28 |
| White | 58.83 | 0.55 | 4.08* | 0.35 |
| Hispanic | 41.56 | 0.64 | -13.19* | 0.83 |
| Black | 33.53 | 0.93 | -21.22* | 1.08 |
| Post High School | 62.14 | 0.66 | 7.39* | 0.38 |
| Grad. High School | 53.91 | 0.71 | -0.84 | 0.53 |
| Not Grad. High School | 44.75 | 0.92 | -10.00* | 0.83 |
| Advantaged Urban | 65.16 | 1.31 | 10.41* | 1.31 |
| Disadvantaged Urban | 41.16 | 2.16 | -13.59* | 2.09 |
| Extreme Rural | 50.91 | 2.48 | -3.84 | 2.35 |
| Fringes | 59.40 | 1.18 | 4.65* | 1.04 |
| Big City | 50.54 | 1.59 | -4.21* | 1.46 |
| Medium City | 59.18 | 2.78 | 4.42 | 2.68 |
| Small Place | 53.71 | 1.07 | -1.04 | 0.92 |
| 7th Grade | 45.73 | 0.78 | -9.02* | 0.50 |
| 8th Grade | 58.89 | 0.61 | 4.14* | 0.25 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Making Measurements | | (12 Exercises) | |
|-----------------------------|---------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 70.92 | 0.69 | | |
| Northeast | 71.53 | 1.20 | 0.61 | 1.12 |
| Central | 76.23 | 1.32 | 5.31* | 1.06 |
| West | 71.01 | 1.12 | 0.09 | 1.05 |
| Southeast | 63.27 | 1.81 | -7.65* | 1.57 |
| Male | 73.16 | 0.81 | 2.24* | 0.39 |
| Female | 68.68 | 0.77 | -2.24* | 0.41 |
| White | 75.39 | 0.59 | 4.47* | 0.47 |
| Hispanic | 58.44 | 1.53 | -12.48* | 1.63 |
| Black | 46.58 | 1.17 | -24.34* | 1.22 |
| Post High School | 77.47 | 0.71 | 6.55* | 0.52 |
| Grad. High School | 70.41 | 0.90 | -0.51 | 0.51 |
| Not Grad. High School | 61.38 | 1.30 | -9.54* | 1.22 |
| Advantaged Urban | 79.65 | 1.90 | 8.73* | 1.81 |
| Disadvantaged Urban | 55.50 | 2.58 | -15.42* | 2.46 |
| Extreme Rural | 65.71 | 2.16 | -5.21* | 2.13 |
| Fringes | 74.70 | 1.27 | 3.77* | 1.18 |
| Big City | 65.53 | 1.88 | -5.39* | 1.63 |
| Medium City | 74.53 | 2.42 | 3.61 | 2.30 |
| Small Place | 70.92 | 0.89 | 0.00 | 0.85 |
| 7th Grade | 63.69 | 0.90 | -7.24* | 0.75 |
| 8th Grade | 74.55 | 0.68 | 3.63* | 0.34 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

Finding Perimeter, Area and Volume (12 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|------------------------|--------------------|-------------------|---|-------------------|
| Nation | 45.06 | 0.68 | | |
| Northeast | 49.51 | 1.37 | 4.45* | 1.16 |
| Central | 48.26 | 1.14 | 3.20* | 0.98 |
| West | 43.23 | 1.47 | -1.83 | 1.24 |
| Southeast | 38.26 | 1.24 | -6.80* | 1.20 |
| Male | 46.54 | 0.72 | 1.48* | 0.34 |
| Female | 43.57 | 0.81 | -1.49* | 0.35 |
| White | 48.45 | 0.62 | 3.39* | 0.33 |
| Hispanic | 33.91 | 1.28 | -11.15* | 1.24 |
| Black | 27.53 | 0.97 | -17.52* | 1.11 |
| Post High School | 52.31 | 0.81 | 7.25* | 0.57 |
| Grad. High School | 43.48 | 0.86 | -1.58* | 0.67 |
| Not Grad. School | 36.83 | 1.11 | -8.22* | 1.00 |
| Advantaged Urban | 56.74 | 1.01 | 11.68* | 1.13 |
| Disadvantaged Urban | 33.48 | 2.41 | -11.58* | 2.34 |
| Extreme Rural | 41.82 | 2.60 | -3.24 | 2.41 |
| Fringes | 50.27 | 1.35 | 5.21* | 1.22 |
| Big City | 41.96 | 1.69 | -3.10 | 1.59 |
| Medium City | 48.26 | 2.77 | 3.20 | 2.76 |
| Small Place | 43.47 | 1.33 | -1.58 | 1.04 |
| 7th Grade | 35.91 | 0.95 | -9.15* | 0.65 |
| 8th Grade | 49.03 | 0.67 | 3.97* | 0.31 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Reading Graphs and Tables (27 Exercises) | | | | |
|--|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 68.85 | 0.65 | | |
| Northeast | 73.46 | 1.02 | 4.62* | 0.98 |
| Central | 70.58 | 1.26 | 1.73 | 1.05 |
| West | 67.60 | 1.08 | -1.24 | 1.00 |
| Southeast | 63.13 | 1.80 | -5.72* | 1.53 |
| Male | 68.61 | 0.74 | -0.24 | 0.28 |
| Female | 69.13 | 0.67 | 0.28 | 0.28 |
| White | 72.17 | 0.59 | 3.32* | 0.36 |
| Hispanic | 57.44 | 0.96 | -11.40* | 1.08 |
| Black | 52.22 | 1.09 | -16.63* | 1.08 |
| Post High School | 75.15 | 0.66 | 6.30* | 0.45 |
| Grad. High School | 68.12 | 0.83 | -0.72 | 0.50 |
| Not Grad. High School | 60.90 | 0.99 | -7.95* | 0.81 |
| Advantaged Urban | 74.80 | 1.01 | 5.95* | 1.05 |
| Disadvantaged Urban | 54.09 | 2.62 | -14.75* | 2.48 |
| Extreme Rural | 63.85 | 1.76 | -6.00* | 1.66 |
| Fringes | 71.62 | 0.97 | 2.77* | 0.93 |
| Big City | 65.65 | 1.35 | -3.20* | 1.17 |
| Medium City | 74.82 | 2.38 | 5.97* | 2.33 |
| Small Place | 67.99 | 1.06 | -0.86 | 0.90 |
| 7th Grade | 59.74 | 0.93 | -9.11* | 0.68 |
| 8th Grade | 72.96 | 0.61 | 4.11 | 0.32 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Geometric Manipulation (19 Exercises) | | | | |
|---------------------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 45.81 | 0.59 | | |
| Northeast | 47.57 | 1.14 | 1.76 | 1.02 |
| Central | 48.38 | 1.39 | 2.57* | 1.08 |
| West | 45.11 | 1.11 | -0.70 | 0.98 |
| Southeast | 41.63 | 1.05 | -4.18* | 1.04 |
| Male | 46.49 | 0.66 | 0.68* | 0.25 |
| Female | 45.10 | 0.63 | -0.71* | 0.25 |
| White | 48.17 | 0.60 | 2.36* | 0.27 |
| Hispanic | 39.40 | 0.76 | -6.41* | 0.81 |
| Black | 33.41 | 0.68 | -12.40* | 0.81 |
| Post High. School | 50.61 | 0.69 | 4.80* | 0.41 |
| Grad. High School | 45.02 | 0.78 | -0.79 | 0.50 |
| Not Grad. High School | 39.68 | 0.67 | -6.13* | 0.76 |
| Advantaged Urban | 52.43 | 1.20 | 6.62* | 1.21 |
| Disadvantaged Urban | 37.68 | 1.47 | -8.13* | 1.58 |
| Extreme Rural | 40.34 | 1.41 | -5.47* | 1.38 |
| Fringes | 49.78 | 0.95 | 3.97* | 0.84 |
| Big City | 43.62 | 1.16 | -2.19 | 1.12 |
| Medium City | 49.76 | 2.55 | 3.96 | 2.41 |
| Small Place | 44.18 | 0.92 | -1.63* | 0.70 |
| 7th Grade | 39.56 | 0.69 | -6.25* | 0.47 |
| 8th Grade | 48.60 | 0.63 | 2.79* | 0.20 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Algebraic Manipulation | | (43 Exercises) | |
|-----------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 52.17 | 0.72 | | |
| Northeast | 57.01 | 1.35 | 4.84* | 1.14 |
| Central | 55.70 | 1.33 | 3.53* | 1.11 |
| West | 49.88 | 1.42 | -2.29* | 1.25 |
| Southeast | 45.05 | 1.45 | -7.12* | 1.37 |
| Male | 51.28 | 0.74 | -0.88* | 0.23 |
| Female | 53.07 | 0.76 | 0.90* | 0.24 |
| White | 55.92 | 0.63 | 3.75* | 0.36 |
| Hispanic | 38.15 | 1.58 | -14.02* | 1.45 |
| Black | 33.58 | 1.02 | -18.59* | 1.20 |
| Post High School | 59.20 | 0.69 | 7.03* | 0.37 |
| Grad. High School | 51.63 | 0.74 | -0.54 | 0.47 |
| Not Grad. High School | 42.63 | 0.76 | -9.54* | 0.72 |
| Advantaged Urban | 61.83 | 0.83 | 9.66* | 1.00 |
| Disadvantaged Urban | 36.63 | 1.63 | -15.54* | 1.65 |
| Extreme Rural | 47.68 | 2.79 | -4.50 | 2.67 |
| Fringes | 57.06 | 1.14 | 4.90* | 0.90 |
| Big City | 48.20 | 1.56 | -3.97* | 1.44 |
| Medium City | 58.31 | 2.63 | 6.14* | 2.54 |
| Small Place | 50.62 | 1.14 | -1.55 | 0.98 |
| 7th Grade | 41.01 | 0.84 | -11.16* | 0.56 |
| 8th Grade | 57.15 | 0.69 | 4.98* | 0.30 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Solving Equations | | (13 Exercises) | | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 63.74 | 0.93 | | |
| Northeast | 69.38 | 1.79 | 5.63* | 1.51 |
| Central | 67.97 | 1.49 | 4.23* | 1.31 |
| West | 60.79 | 2.08 | -2.96* | 1.76 |
| Southeast | 55.71 | 1.73 | -8.03* | 1.66 |
| Male | 61.38 | 0.98 | -2.37* | 0.36 |
| Female | 66.19 | 1.01 | 2.44* | 0.38 |
| White | 67.86 | 0.78 | 4.12* | 0.44 |
| Hispanic | 46.49 | 2.76 | -17.25* | 2.56 |
| Black | 43.93 | 1.40 | -19.82* | 1.54 |
| Post High School | 71.07 | 0.75 | 7.32* | 0.49 |
| Grad. High School | 63.42 | 1.08 | -0.32 | 0.63 |
| Not Grad. High School | 53.49 | 1.17 | -10.25* | 1.13 |
| Advantaged Urban | 73.80 | 1.37 | 10.05* | 1.52 |
| Disadvantaged Urban | 47.24 | 1.76 | -16.51* | 1.89 |
| Extreme Rural | 58.13 | 3.11 | -5.62 | 2.96 |
| Fringes | 69.80 | 1.39 | 6.06* | 1.08 |
| Big City | 58.98 | 1.91 | -4.77* | 1.83 |
| Medium City | 70.45 | 3.31 | 6.70* | 3.25 |
| Small Place | 61.87 | 1.49 | -1.87 | 1.17 |
| 7th Grade | 50.58 | 1.28 | -13.17* | 0.78 |
| 8th Grade | 69.62 | 0.86 | 5.87* | 0.38 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Plotting Points | | (15 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 57.04 | 0.87 | | |
| Northeast | 62.58 | 1.52 | 5.55* | 1.34 |
| Central | 61.75 | 1.70 | 4.71* | 1.40 |
| West | 55.68 | 1.70 | -1.36 | 1.50 |
| Southeast | 46.58 | 1.98 | -10.46* | 1.84 |
| Male | 57.22 | 0.96 | 0.18 | 0.34 |
| Female | 56.82 | 0.91 | -0.21 | 0.34 |
| White | 61.67 | 0.75 | 4.63* | 0.47 |
| Hispanic | 42.81 | 1.99 | -14.22* | 1.83 |
| Black | 32.57 | 1.62 | -24.47* | 1.69 |
| Post High School | 65.61 | 0.92 | 8.57* | 0.48 |
| Grad. High School | 56.19 | 0.97 | -0.85 | 0.65 |
| Not Grad. High School | 45.39 | 1.15 | -11.64* | 1.11 |
| Advantaged Urban | 68.24 | 1.52 | 11.20* | 1.56 |
| Disadvantaged Urban | 38.81 | 2.46 | -18.23* | 2.38 |
| Extreme Rural | 50.50 | 3.39 | -6.54* | 3.27 |
| Fringes | 62.74 | 1.44 | 5.70* | 1.20 |
| Big City | 51.83 | 2.22 | -5.21* | 1.96 |
| Medium City | 64.04 | 2.59 | 7.01* | 2.53 |
| Small Place | 55.52 | 1.37 | -1.51 | 1.16 |
| 7th Grade | 43.75 | 1.00 | -13.29* | 0.72 |
| 8th Grade | 63.00 | 0.84 | 5.96* | 0.40 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Estimation | | (22 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 32.75 | 0.55 | | |
| Northeast | 35.40 | 1.16 | 2.65* | 0.97 |
| Central | 35.47 | 0.95 | 2.72* | 0.81 |
| West | 31.10 | 1.06 | -1.66 | 0.94 |
| Southeast | 28.36 | 1.19 | -4.39* | 1.08 |
| Male | 34.16 | 0.56 | 1.40* | 0.29 |
| Female | 31.34 | 0.69 | -1.41* | 0.30 |
| White | 35.17 | 0.54 | 2.42* | 0.25 |
| Hispanic | 24.52 | 1.16 | -8.24* | 1.17 |
| Black | 19.88 | 0.62 | -12.88* | 0.77 |
| Post High School | 38.86 | 0.66 | 6.11* | 0.38 |
| Grad. High School | 31.20 | 0.58 | -1.55* | 0.47 |
| Not Grad. High School | 24.96 | 0.62 | -7.79* | 0.70 |
| Advantaged Urban | 40.30 | 1.30 | 7.55* | 1.32 |
| Disadvantaged Urban | 24.58 | 1.19 | -8.17* | 1.18 |
| Extreme Rural | 28.55 | 1.29 | -4.20* | 1.28 |
| Fringes | 36.24 | 1.09 | 3.48* | 0.94 |
| Big City | 30.90 | 1.15 | -1.35 | 1.07 |
| Medium City | 36.78 | 2.09 | 4.03* | 1.99 |
| Small Place | 31.18 | 0.81 | -1.57* | 0.68 |
| 7th Grade | 25.58 | 0.61 | -7.17* | 0.54 |
| 8th Grade | 35.95 | 0.60 | 3.20* | 0.22 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Mathematical Understanding (108 Exercises) | | | | |
|--|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 51.72 | 0.49 | | |
| Northeast | 54.74 | 0.78 | 3.02* | 0.72 |
| Central | 54.65 | 0.98 | 2.92* | 0.78 |
| West | 49.99 | 1.00 | -1.73 | 0.38 |
| Southeast | 46.78 | 1.12 | -4.94* | 1.03 |
| Male | 51.86 | 0.49 | 0.14 | 0.20 |
| Female | 51.57 | 0.56 | -0.16 | 0.20 |
| White | 54.75 | 0.41 | 3.03* | 0.27 |
| Hispanic | 39.89 | 1.10 | -11.83* | 1.04 |
| Black | 36.96 | 0.61 | -14.77* | 0.80 |
| Post High School | 58.19 | 0.48 | 6.46* | 0.32 |
| Grad. High School | 50.78 | 0.57 | -0.94* | 0.42 |
| Not Grad. High School | 43.43 | 0.59 | -8.29* | 0.61 |
| Advantaged Urban | 58.90 | 0.76 | 7.18* | 0.84 |
| Disadvantaged Urban | 41.32 | 1.75 | -10.40* | 1.70 |
| Extreme Rural | 47.41 | 1.81 | -4.31* | 1.70 |
| Fringes | 55.65 | 0.80 | 3.93* | 0.67 |
| Big City | 49.19 | 1.14 | -2.54* | 1.03 |
| Medium City | 55.03 | 1.90 | 3.30 | 1.85 |
| Small Place | 50.40 | 0.80 | -1.32 | 0.68 |
| 7th Grade | 42.90 | 0.57 | -8.82* | 0.42 |
| 8th Grade | 55.58 | 0.48 | -3.35* | 0.21 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Mathematical Applications (106 Exercises) | | | | |
|---|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 43.34 | 0.50 | | |
| Northeast | 46.04 | 0.89 | 2.70* | 0.78 |
| Central | 45.92 | 1.00 | 2.58* | 0.80 |
| West | 42.43 | 1.00 | -0.91 | 0.87 |
| Southeast | 38.27 | 1.07 | -5.08* | 1.01 |
| Male | 44.13 | 0.53 | 0.78* | 0.18 |
| Female | 42.53 | 0.52 | -0.82* | 0.19 |
| White | 46.12 | 0.43 | 2.77* | 0.24 |
| Hispanic | 32.89 | 0.73 | -10.45* | 0.83 |
| Black | 29.69 | 0.57 | -13.65* | 0.73 |
| Post High School | 49.41 | 0.49 | 6.07* | 0.31 |
| Grad. High School | 42.16 | 0.56 | -1.18* | 0.24 |
| Not Grad. High School | 35.81 | 0.56 | -7.53* | 0.66 |
| Advantaged Urban | 50.25 | 0.72 | 6.91* | 0.83 |
| Disadvantaged Urban | 33.18 | 1.41 | -10.16* | 1.40 |
| Extreme Rural | 39.91 | 1.57 | -3.44* | 1.49 |
| Fringes | 47.50 | 0.83 | 4.15* | 0.66 |
| Big City | 40.60 | 1.05 | -2.74* | 1.00 |
| Medium City | 47.02 | 1.64 | 3.67* | 1.58 |
| Small Place | 41.99 | 0.77 | -1.35 | 0.65 |
| 7th Grade | 35.30 | 0.62 | -8.04* | 0.40 |
| 8th Grade | 46.88 | 0.47 | 3.53* | 0.19 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Routine Problems | | (85 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 41.43 | 0.53 | | |
| Northeast | 44.42 | 0.96 | 2.99* | 0.83 |
| Central | 44.10 | 1.07 | 2.68* | 0.86 |
| West | 40.37 | 1.08 | -1.06 | 0.94 |
| Southeast | 36.09 | 1.02 | -5.34* | 1.01 |
| Male | 42.26 | 0.56 | 0.83* | 0.19 |
| Female | 40.57 | 0.56 | -0.86* | 0.20 |
| White | 44.34 | 0.46 | 2.92* | 0.26 |
| Hispanic | 30.60 | 0.56 | -10.82* | 0.72 |
| Black | 26.90 | 0.60 | -14.53* | 0.76 |
| Post High School | 47.84 | 0.53 | 6.42* | 0.33 |
| Grad. High School | 40.21 | 0.58 | -1.22* | 0.37 |
| Not Grad. High School | 33.31 | 0.60 | -8.12* | 0.68 |
| Advantaged- Urban | 48.81 | 0.35 | 7.38* | 0.94 |
| Disadvantaged- Urban | 30.47 | 1.55 | -10.96* | 1.54 |
| Extreme Rural | 37.91 | 1.65 | -3.52* | 1.57 |
| Fringes | 45.69 | 0.89 | 4.26* | 0.71 |
| Big City | 38.62 | 1.11 | -2.81* | 1.06 |
| Medium City | 45.32 | 1.97 | 3.89* | 1.89 |
| Small Place | 40.01 | 0.81 | -1.42* | 0.69 |
| 7th Grade | 32.78 | 0.66 | -8.65* | 0.42 |
| 8th Grade | 45.24 | 0.51 | 3.81* | 0.21 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| One-Step Word Problems | | | (27 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 52.08 | 0.68 | | |
| Northeast | 56.69 | 1.35 | 4.60* | 1.12 |
| Central | 54.90 | 1.25 | 2.81* | 1.04 |
| West | 50.74 | 1.28 | -1.34 | 1.14 |
| Southeast | 45.30 | 1.48 | -6.78* | 1.38 |
| Male | 52.33 | 0.72 | 0.24 | 0.30 |
| Female | 51.82 | 0.77 | -0.26 | 0.32 |
| White | 55.69 | 0.59 | 3.60* | 0.33 |
| Hispanic | 39.53 | 1.32 | -12.55* | 1.37 |
| Black | 33.72 | 0.71 | -18.37* | 0.92 |
| Post High School | 59.76 | 0.66 | 7.68* | 0.38 |
| Grad. High School | 50.97 | 0.74 | -1.11* | 0.47 |
| Not Grad. High School | 42.76 | 0.80 | -9.32* | 0.92 |
| Advantaged Urban | 59.55 | 1.15 | 7.47* | 1.27 |
| Disadvantaged Urban | 39.69 | 1.85 | -12.40* | 1.83 |
| Extreme Rural | 48.03 | 2.20 | -4.05 | 2.08 |
| Fringes | 56.66 | 1.12 | 4.58* | 0.92 |
| Big City | 48.19 | 1.29 | 8.90* | 1.27 |
| Medium City | 56.94 | 2.51 | 4.86* | 2.10 |
| Small Place | 50.90 | 1.10 | -1.19 | 0.38 |
| 7th Grade | 40.99 | 0.88 | -11.10* | 0.56 |
| 8th Grade | 57.04 | 0.61 | 4.96* | 0.29 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Multistep Word Problems | | (13 Exercises) | | |
|-----------------------------|--------------------|-------------------|--|-------------------|
| | Mean Percentage | Standard Error | Mean Percent. Difference From Nation | Standard Error |
| Nation | 36.82 | 0.66 | | |
| Northeast | 39.05 | 1.08 | 2.23* | 1.03 |
| Central | 40.00 | 1.40 | 3.18* | 1.10 |
| West | 34.92 | 1.52 | -1.90 | 1.27 |
| Southeast | 32.54 | 1.26 | -4.27* | 1.22 |
| Male | 38.49 | 0.84 | 1.67* | 0.39 |
| Female | 35.09 | 0.70 | -1.73* | 0.41 |
| White | 39.54 | 0.66 | 2.72* | 0.28 |
| Hispanic | 25.18 | 1.30 | -11.64* | 1.34 |
| Black | 24.17 | 1.14 | -12.65* | 1.19 |
| Post High School | 43.58 | 0.84 | 6.76* | 0.43 |
| Grad. High School | 35.26 | 0.69 | -1.56* | 0.45 |
| Not Grad. High School | 29.00 | 0.95 | -7.82* | 1.00 |
| Advantaged Urban | 45.70 | 1.78 | 8.89* | 1.60 |
| Disadvantaged Urban | 25.46 | 2.33 | -11.36* | 2.23 |
| Extreme Rural | 32.82 | 1.60 | -4.00* | 1.60 |
| Fringes | 41.10 | 1.36 | 4.28* | 1.13 |
| Big City | 35.25 | 1.48 | -1.57 | 1.23 |
| Medium City | 41.06 | 2.15 | 4.24 | 2.13 |
| Small Place | 34.81 | 0.82 | -2.01* | 0.75 |
| 7th Grade | 27.61 | 0.83 | -9.21* | 0.59 |
| 8th Grade | 40.82 | 0.73 | 4.00* | 0.30 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| Graph and Table Problems (13 Exercises) | | | | |
|---|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 55.26 | 0.71 | | |
| Northeast | 58.79 | 1.42 | 3.53* | 1.20 |
| Central | 59.01 | 1.34 | 3.74* | 1.10 |
| West | 54.72 | 1.64 | -0.55 | 1.38 |
| Southeast | 47.54 | 1.23 | -7.73* | 1.30 |
| Male | 56.67 | 0.78 | 1.41* | 0.33 |
| Female | 53.79 | 0.79 | -1.47* | 0.36 |
| White | 59.16 | 0.65 | 3.90* | 0.40 |
| Hispanic | 41.78 | 1.12 | -13.48* | 1.20 |
| Black | 35.62 | 1.31 | -19.64* | 1.45 |
| Post High School | 63.72 | 0.37 | 8.46* | 0.67 |
| Grad. High School | 53.79 | 0.91 | -1.47 | 0.75 |
| Not Grad. High School | 43.80 | 1.27 | -11.46* | 1.40 |
| Advantaged Urban | 64.76 | 1.36 | 9.50* | 1.43 |
| Disadvantaged Urban | 39.06 | 2.71 | -16.21* | 2.67 |
| Extreme Rural | 49.78 | 1.78 | -5.48* | 1.68 |
| Fringes | 61.81 | 1.34 | 6.55* | 1.04 |
| Big City | 51.35 | 1.63 | -3.92* | 1.54 |
| Medium City | 59.99 | 2.46 | 4.73 | 2.43 |
| Small Place | 53.17 | 1.09 | -2.09* | 0.93 |
| 7th Grade | 45.09 | 1.04 | -10.17* | 0.84 |
| 8th Grade | 60.05 | 0.70 | 4.78* | 0.36 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

| | Geometric Problems | | (13 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 25.86 | 0.50 | | |
| Northeast | 27.03 | 1.11 | 1.17 | 0.94 |
| Central | 26.41 | 0.94 | 0.55 | 0.79 |
| West | 26.21 | 1.00 | 0.35 | 0.86 |
| Southeast | 23.57 | 0.89 | -2.30* | 0.84 |
| Male | 26.78 | 0.56 | 0.92* | 0.29 |
| Female | 24.88 | 0.59 | -0.98* | 0.29 |
| White | 27.03 | 0.52 | 1.17* | 0.16 |
| Hispanic | 22.08 | 0.94 | -3.78* | 1.01 |
| Black | 19.53 | 0.73 | -6.33* | 0.68 |
| Post High School | 28.83 | 0.67 | 2.97* | 0.38 |
| Grad. High School | 24.74 | 0.71 | -1.12* | 0.45 |
| Not Grad. High School | 22.55 | 0.60 | -3.31* | 0.71 |
| Advantaged Urban | 30.38 | 1.38 | 4.52* | 1.31 |
| Disadvantaged Urban | 21.07 | 1.19 | -4.79* | 1.21 |
| Extreme Rural | 24.80 | 1.33 | -1.06 | 1.33 |
| Fringes | 28.17 | 0.98 | 2.31* | 0.84 |
| Big City | 24.33 | 0.83 | -1.53 | 0.78 |
| Medium City | 28.54 | 1.16 | 2.67* | 1.05 |
| Small Place | 24.96 | 0.66 | -0.90 | 0.51 |
| 7th Grade | 21.85 | 0.56 | -4.01* | 0.62 |
| 8th Grade | 27.50 | 0.62 | 1.64* | 0.22 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 7 (Continued). Age 13 -- Mean Performance Percentages
1977

Combination, Statistics and Probability Problems
(11 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 32.52 | 0.51 | | |
| Northeast | 34.58 | 0.77 | 2.06* | 0.72 |
| Central | 34.80 | 1.06 | 2.28* | 0.84 |
| West | 31.57 | 0.84 | -0.95 | 0.78 |
| Southeast | 28.49 | 1.15 | -4.04* | 1.02 |
| Male | 32.77 | 0.62 | 0.25 | 0.30 |
| Female | 32.27 | 0.57 | -0.25 | 0.32 |
| White | 34.91 | 0.50 | 2.38* | 0.25 |
| Hispanic | 21.48 | 0.90 | -11.05* | 1.07 |
| Black | 21.70 | 1.02 | -10.83* | 1.13 |
| Post High School | 37.16 | 0.52 | 4.64* | 0.39 |
| Grad. High School | 31.72 | 0.63 | -0.81* | 0.33 |
| Not Grad. High School | 25.03 | 0.93 | -7.49* | 0.91 |
| Advantaged Urban | 39.87 | 1.25 | 7.34* | 1.30 |
| Disadvantaged Urban | 25.09 | 0.97 | -7.44* | 1.04 |
| Extreme Rural | 28.68 | 1.69 | -3.85* | 1.58 |
| Fringes | 36.59 | 0.65 | 4.07* | 0.66 |
| Big City | 30.89 | 1.11 | -1.64 | 1.01 |
| Medium City | 34.54 | 1.36 | 2.01 | 1.34 |
| Small Place | 30.76 | 0.93 | -1.77* | 0.72 |
| 7th Grade | 26.31 | 0.69 | -6.21* | 0.44 |
| 8th Grade | 35.05 | 0.51 | 2.52* | 0.20 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 8. Age 17 -- Mean Performance Percentages
1978

| | Mathematical Knowledge | | (140 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 71.71 | 0.45 | | |
| Northeast | 74.16 | 0.78 | 2.45* | 0.72 |
| Central | 74.17 | 0.92 | 2.46* | 0.69 |
| West | 69.06 | 0.88 | -2.65* | 0.77 |
| Southeast | 68.17 | 0.62 | -3.54* | 0.66 |
| Male | 72.82 | 0.47 | 1.11* | 0.20 |
| Female | 70.66 | 0.51 | -1.05* | 0.20 |
| White | 74.34 | 0.38 | 2.63* | 0.24 |
| Hispanic | 59.89 | 0.92 | -11.82* | 0.85 |
| Black | 56.24 | 0.68 | -15.47* | 0.66 |
| Post High School | 77.23 | 0.38 | 5.52* | 0.20 |
| Grad. High School | 69.21 | 0.48 | -2.50* | 0.26 |
| Not Grad. High School | 62.29 | 0.50 | -9.42* | 0.44 |
| Advantaged | | | | |
| Urban | 79.35 | 0.78 | 7.64* | 0.79 |
| Disadvantaged | | | | |
| Urban | 59.22 | 1.04 | -12.49* | 1.11 |
| Extreme Rural | 70.60 | 0.92 | -1.10 | 0.87 |
| Fringes | 74.37 | 0.92 | 2.66* | 0.84 |
| Big City | 69.02 | 1.19 | -2.69* | 1.01 |
| Medium City | 74.92 | 1.24 | 3.21* | 1.26 |
| Small Place | 70.97 | 0.52 | -0.74 | 0.45 |
| 10th Grade | 60.18 | 0.72 | -11.53* | 0.53 |
| 11th Grade | 73.88 | 0.46 | 2.17* | 0.16 |
| 12th Grade | 74.72 | 0.54 | 3.01* | 0.53 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Numbers and Numeration | | (68 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 77.90 | 0.43 | | |
| Northeast | 79.44 | 0.82 | 1.54* | 0.73 |
| Central | 80.34 | 0.85 | 2.45* | 0.56 |
| West | 75.96 | 0.78 | -1.93* | 0.70 |
| Southeast | 74.67 | 0.81 | -3.23* | 0.76 |
| Male | 78.19 | 0.51 | 0.30 | 0.23 |
| Female | 77.62 | 0.47 | -0.28 | 0.23 |
| White | 80.41 | 0.36 | 2.51* | 0.24 |
| Hispanic | 67.30 | 1.06 | -10.59* | 1.00 |
| Black | 63.03 | 0.83 | -14.87* | 0.78 |
| Post High School | 82.89 | 0.36 | 5.00* | 0.22 |
| Grad. High School | 75.50 | 0.54 | -2.39* | 0.30 |
| Not Grad. High School | 69.92 | 0.58 | -7.97* | 0.49 |
| Advantaged | 84.58 | 0.82 | 6.68* | 0.77 |
| Urban | | | | |
| Disadvantaged | 65.99 | 1.15 | -11.91* | 1.16 |
| Urban | | | | |
| Extreme Rural | 77.55 | 0.92 | -0.34 | 0.90 |
| Fringes | 80.33 | 0.84 | 2.43* | 0.78 |
| Big City | 74.76 | 1.13 | -3.14* | 0.99 |
| Medium City | 81.36 | 0.93 | 3.46* | 0.97 |
| Small Place | 77.40 | 0.52 | -0.50 | 0.42 |
| 10th Grade | 66.38 | 0.83 | -11.52* | 0.64 |
| 11th Grade | 80.07 | 0.42 | 2.18* | 0.19 |
| 12th Grade | 81.10 | 0.51 | 3.20* | 0.50 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978.

| | Basic Facts | | (23 Exercises) | |
|--------------------------|-----------------|----------------|-------------------------------------|----------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 93.74 | 0.29 | | |
| Northeast | 94.57 | 0.64 | 0.83 | 0.55 |
| Central | 94.96 | 0.39 | 1.22* | 0.38 |
| West | 92.80 | 0.56 | -0.95 | 0.48 |
| Southeast | 92.19 | 0.73 | -1.56* | 0.63 |
| Male | 93.07 | 0.35 | -0.67* | 0.18 |
| Female | 94.38 | 0.33 | 0.54* | 0.18 |
| White | 94.82 | 0.29 | 1.08* | 0.19 |
| Hispanic | 91.13 | 1.32 | -2.61* | 1.27 |
| Black | 86.79 | 1.21 | -6.95* | 1.10 |
| Post High School | 95.85 | 0.33 | 2.11* | 0.27 |
| Grad. High School | 92.90 | 0.49 | -0.84* | 0.32 |
| Not Grad. High School | 90.95 | 0.64 | -2.79* | 0.57 |
| Advantaged | | | | |
| Urban | 96.14 | 0.29 | 2.40* | 0.38 |
| Disadvantaged | | | | |
| Urban | 89.31 | 1.14 | -4.44* | 1.16 |
| Extreme Rural | 93.76 | 0.69 | 0.01 | 0.64 |
| Fringes | 94.70 | 0.45 | 0.96 | 0.52 |
| Big City | 92.40 | 0.91 | -1.34* | 0.77 |
| Medium City | 96.37 | 0.60 | 2.63* | 0.58 |
| Small Place | 93.48 | 0.37 | -0.26 | 0.30 |
| 10th Grade | 87.60 | 1.36 | -6.14* | 1.16 |
| 11th Grade | 94.84 | 0.25 | 1.10* | 0.22 |
| 12th Grade | 95.48 | 0.57 | 1.74* | 0.52 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued) Age 17 -- Mean Performance Percentages
1978

| | Ordering | | (11 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 64.48 | 0.79 | | |
| Northeast | 66.92 | 1.47 | 2.44 | 1.31 |
| Central | 68.97 | 1.39 | 4.49* | 1.15 |
| West | 61.48 | 1.79 | -2.99 | 1.53 |
| Southeast | 58.26 | 1.67 | -6.22* | 1.54 |
| Male | 67.69 | 1.06 | 3.21* | 0.56 |
| Female | 61.45 | 0.84 | -3.03* | 0.54 |
| White | 68.48 | 0.64 | 4.00* | 0.44 |
| Hispanic | 48.02 | 2.89 | -16.46* | 2.82 |
| Black | 40.96 | 1.31 | -23.52* | 1.15 |
| Post High School | 72.13 | 0.73 | 7.65* | 0.43 |
| Grad. High School | 61.02 | 0.99 | -3.46* | 0.61 |
| Not Grad. High School | 51.43 | 1.07 | -13.05* | 0.99 |
| Advantaged | | | | |
| Urban | 74.77 | 1.65 | 10.29* | 1.62 |
| Disadvantaged | | | | |
| Urban | 46.07 | 2.58 | -18.41* | 2.51 |
| Extreme Rural | 64.88 | 1.39 | 0.40 | 1.55 |
| Fringes | 68.64 | 1.32 | 4.16* | 1.20 |
| Big City | 59.90 | 1.92 | -4.57* | 1.54 |
| Medium City | 69.50 | 1.94 | 5.02* | 2.04 |
| Small Place | 63.44 | 1.06 | -1.04 | 0.85 |
| 10th Grade | 49.50 | 1.28 | -14.98* | 1.05 |
| 11th Grade | 67.22 | 0.76 | 2.74* | 0.33 |
| 12th Grade | 69.51 | 1.22 | 5.03* | 1.14 |

*Indicates mean percentage significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

Number and Operation Properties (18 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|--------------------------|--------------------|-------------------|---|-------------------|
| Nation | 77.24 | 0.57 | | |
| Northeast | 78.88 | 1.05 | 1.64 | 0.96 |
| Central | 79.42 | 1.09 | 2.18* | 0.84 |
| West | 75.30 | 1.30 | -1.94 | 1.10 |
| Southeast | 74.29 | 0.87 | -2.96* | 0.89 |
| Male | 76.80 | 0.68 | -0.44 | 0.35 |
| Female | 77.67 | 0.64 | 0.43 | 0.33 |
| White | 79.92 | 0.45 | 2.68* | 0.34 |
| Hispanic | 64.90 | 1.47 | -12.34* | 1.42 |
| Black | 61.54 | 1.35 | -15.70* | 1.24 |
| Post High School | 83.08 | 0.56 | 5.84* | 0.39 |
| Grad. High School | 74.04 | 0.88 | -3.20* | 0.60 |
| Not Grad. High School | 68.15 | 0.93 | -9.09* | 0.85 |
| Advantaged | | | | |
| Urban | 84.79 | 1.10 | 7.55* | 1.04 |
| Disadvantaged | | | | |
| Urban | 61.98 | 1.74 | -15.26* | 1.54 |
| Extreme Rural | 76.16 | 1.02 | -1.08 | 1.13 |
| Fringes | | | | |
| Big City | 79.98 | 1.26 | 2.74* | 1.02 |
| Medium City | 73.59 | 1.48 | -3.65* | 1.30 |
| Small Place | 80.04 | 1.56 | 2.80 | 1.57 |
| | 76.63 | 0.57 | -0.61 | 0.59 |
| 10th Grade | | | | |
| 11th Grade | 62.91 | 1.34 | -14.33* | 1.20 |
| 12th Grade | 80.09 | 0.55 | 2.85* | 0.30 |
| | 80.64 | 0.91 | 3.40* | 0.78 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Geometry Knowledge | | (46 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 67.53 | 0.55 | | |
| Northeast | 70.60 | 0.87 | 3.07* | 0.33 |
| Central | 70.30 | 1.19 | 2.76* | 0.38 |
| West | 64.38 | 1.16 | -3.15* | 1.00 |
| Southeast | 63.42 | 0.46 | -4.11* | 0.66 |
| Male | 68.96 | 0.52 | 1.43* | 0.32 |
| Female | 66.18 | 0.72 | -1.35 | 0.30 |
| White | 70.45 | 0.47 | 2.92* | 0.27 |
| Hispanic | 53.75 | 1.20 | -13.78* | 1.12 |
| Black | 50.44 | 0.97 | -17.10* | 0.80 |
| Post High School | 74.03 | 0.50 | 6.50* | 0.26 |
| Grad. High School | 64.69 | 0.54 | -2.85* | 0.33 |
| Not Grad. High School | 55.80 | 0.60 | -11.73* | 0.36 |
| Advantaged | | | | |
| Urban | 77.13 | 0.91 | 9.59* | 1.00 |
| Disadvantaged | | | | |
| Urban | 53.43 | 1.47 | -14.11* | 1.51 |
| Extreme Rural | 65.15 | 1.00 | -2.38* | 0.97 |
| Fringes | 70.82 | 1.12 | 3.29* | 0.99 |
| Big City | 65.25 | 1.49 | -2.28 | 1.22 |
| Medium City | 70.05 | 1.95 | 2.51 | 1.92 |
| Small Place | 66.46 | 0.62 | -1.08 | 0.60 |
| 10th Grade | 55.67 | 0.91 | -11.86* | 0.73 |
| 11th Grade | 69.85 | 0.58 | 2.32* | 0.18 |
| 12th Grade | 70.10 | 0.92 | 2.57* | 0.91 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| Measurement Knowledge (17 Exercises) | | | | |
|--------------------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 78.71 | 0.51 | | |
| Northeast | 80.35 | 0.71 | 1.64* | 0.72 |
| Central | 81.61 | 0.95 | 2.90* | 0.68 |
| West | 75.81 | 1.37 | -2.90* | 1.10 |
| Southeast | 75.70 | 0.67 | -3.00* | 0.73 |
| Male | 82.35 | 0.54 | 3.64* | 0.31 |
| Female | 75.19 | 0.64 | -3.52* | 0.30 |
| White | 81.52 | 0.42 | 2.81* | 0.31 |
| Hispanic | 66.88 | 1.91 | -11.83* | 1.71 |
| Black | 62.27 | 1.01 | -16.44* | 0.94 |
| Post High School | 83.03 | 0.44 | 4.32* | 0.33 |
| Grad. High School | 77.40 | 0.66 | -1.31 | 0.44 |
| Not Grad. High School | 70.96 | 1.10 | -7.74* | 0.89 |
| Advantaged- Urban | 83.44 | 0.83 | 4.73* | 0.88 |
| Disadvantaged Urban | 66.12 | 1.10 | -12.59* | 1.19 |
| Extreme Rural | 80.05 | 1.82 | 1.34 | 1.63 |
| Fringes | 79.60 | 1.02 | 0.89 | 0.90 |
| Big City | 75.40 | 1.23 | -3.31* | 1.09 |
| Medium City | 82.47 | 0.90 | 3.77* | 1.00 |
| Small Place | 79.09 | 0.76 | 0.38 | 0.55 |
| 10th Grade | 69.50 | 1.09 | -9.20* | 0.92 |
| 11th Grade | 80.65 | 0.52 | 1.94* | 0.20 |
| 12th Grade | 79.75 | 0.85 | 1.04 | 0.79 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Mathematical Skills (273 Exercises) | | | |
|--------------------------|-------------------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 58.97 | 0.53 | | |
| Northeast | 62.32 | 1.11 | 3.35* | 0.97 |
| Central | 61.57 | 1.04 | 2.60* | 0.80 |
| West | 56.22 | 1.10 | -2.74* | 0.95 |
| Southeast | 54.34 | 0.74 | -4.63* | 0.81 |
| Male | 60.27 | 0.58 | 1.30* | 0.21 |
| Female | 57.74 | 0.56 | -1.23* | 0.20 |
| White | 61.89 | 0.47 | 2.92* | 0.27 |
| Hispanic | 46.95 | 0.76 | -12.02* | 0.74 |
| Black | 41.39 | 0.73 | -17.58* | 0.68 |
| Post High School | 65.23 | 0.50 | 6.26* | 0.20 |
| Grad. High School | 56.01 | 0.51 | -2.96* | 0.29 |
| Not Grad. High School | 48.12 | 0.59 | -10.34* | 0.50 |
| Advantaged | | | | |
| Urban | 68.72 | 0.98 | 9.76* | 1.04 |
| Disadvantaged | | | | |
| Urban | 45.59 | 1.27 | -13.38* | 1.37 |
| Extreme Rural | 56.42 | 0.91 | -2.55* | 0.90 |
| Fringes | 62.11 | 1.00 | 3.14* | 0.97 |
| Big City | 56.88 | 1.51 | -2.08 | 1.25 |
| Medium City | 64.43 | 1.54 | 5.46* | 1.56 |
| Small Place | 57.40 | 0.63 | -1.57* | 0.56 |
| 10th Grade | 45.64 | 0.79 | -13.32* | 0.54 |
| 11th Grade | 61.25 | 0.56 | 2.28* | 0.17 |
| 12th Grade | 63.36 | 0.68 | 4.40* | 0.64 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Computation | | (127 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 67.17 | 0.58 | | |
| Northeast | 71.06 | 1.16 | 3.90* | 1.03 |
| Central | 69.34 | 1.08 | 2.17* | 0.86 |
| West | 64.22 | 1.23 | -2.94* | 1.05 |
| Southeast | 62.84 | 1.00 | -4.33* | 0.98 |
| Male | 67.65 | 0.62 | 0.48* | 0.23 |
| Female | 66.72 | 0.62 | -0.45* | 0.22 |
| White | 70.09 | 0.51 | 2.92* | 0.29 |
| Hispanic | 54.87 | 1.17 | -12.30* | 1.00 |
| Black | 49.60 | 0.96 | -17.57* | 0.87 |
| Post High School | 73.34 | 0.52 | 6.18* | 0.26 |
| Grad. High School | 64.38 | 0.61 | -2.79* | 0.34 |
| Not Grad. High School | 56.27 | 0.74 | -10.90* | 0.62 |
| Advantaged | | | | |
| Urban | 76.91 | 0.90 | 9.74* | 1.00 |
| Disadvantaged | | | | |
| Urban | 53.34 | 1.26 | -13.33* | 1.42 |
| Extreme Rural | 64.24 | 1.06 | -2.93* | 1.00 |
| Fringes | 70.22 | 1.05 | 3.05* | 1.08 |
| Big City | 65.00 | 1.63 | -2.16 | 1.38 |
| Medium City | 73.56 | 1.33 | 6.39* | 1.41 |
| Small Place | 65.57 | 0.76 | -1.60* | 0.62 |
| 10th Grade | 53.28 | 0.97 | -13.39* | 0.68 |
| 11th Grade | 69.58 | 0.61 | 2.42* | 0.18 |
| 12th Grade | 71.12 | 0.33 | 3.96* | 0.81 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Whole Number Computation (18 Exercises) | | | |
|-----------------------|---|----------------|-------------------------------------|----------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 87.54 | 0.35 | | |
| Northeast | 88.23 | 0.62 | 0.69 | 0.57 |
| Central | 88.32 | 0.64 | 0.78 | 0.53 |
| West | 86.48 | 0.67 | -1.06 | 0.59 |
| Southeast | 86.81 | 0.90 | -0.73 | 0.77 |
| Male | 86.91 | 0.45 | -0.63* | 0.22 |
| Female | 88.14 | 0.37 | 0.60* | 0.21 |
| White | 88.86 | 0.30 | 1.32* | 0.18 |
| Hispanic | 83.03 | 1.35 | -4.51* | 1.26 |
| Black | 79.48 | 0.87 | -8.06* | 0.75 |
| Post High School | 89.64 | 0.42 | 2.10* | 0.26 |
| Grad. High School | 86.76 | 0.46 | -0.78* | 0.35 |
| Not Grad. High School | 83.72 | 0.80 | -3.92* | 0.67 |
| Advantaged | | | | |
| Urban | 90.61 | 0.62 | 3.07* | 0.63 |
| Disadvantaged | | | | |
| Urban | 80.78 | 0.86 | -6.76* | 0.84 |
| Extreme Rural | 87.22 | 1.13 | -0.32 | 1.06 |
| Fringes | 88.33 | 0.63 | 0.79 | 0.57 |
| Big City | 85.86 | 0.81 | -1.68* | 0.65 |
| Medium City | 89.73 | 0.65 | 2.19* | 0.69 |
| Small Place | 87.54 | 0.42 | 0.00 | 0.32 |
| 10th Grade | 81.18 | 0.76 | -6.36* | 0.67 |
| 11th Grade | 88.72 | 0.39 | 1.18* | 0.16 |
| 12th Grade | 88.84 | 0.65 | 1.30 | 0.68 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

Computation With Fractions (30 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|--------------------------|--------------------|-------------------|---|-------------------|
| Nation | 65.82 | 0.67 | | |
| Northeast | 70.53 | 1.27 | 4.81* | 1.16 |
| Central | 66.91 | 1.30 | 1.09 | 1.01 |
| West | 63.68 | 1.33 | -2.14 | 1.16 |
| Southeast | 61.16 | 1.41 | -4.66* | 1.32 |
| Male | 65.31 | 0.73 | -0.51 | 0.30 |
| Female | 66.31 | 0.73 | 0.49 | 0.29 |
| White | 68.88 | 0.59 | 3.06* | 0.36 |
| Hispanic | 51.49 | 1.66 | -14.33* | 1.58 |
| Black | 47.88 | 1.74 | -17.93* | 1.60 |
| Post High School | 72.03 | 0.67 | 6.21* | 0.38 |
| Grad. High School | 63.38 | 0.79 | -2.44* | 0.52 |
| Not Grad. High School | 53.97 | 1.09 | -11.84* | 0.92 |
| Advantaged | | | | |
| Urban | 76.23 | 1.05 | 10.41* | 1.11 |
| Disadvantaged | | | | |
| Urban | 52.47 | 1.61 | -13.34* | 1.74 |
| Extreme Rural | 61.40 | 1.68 | -4.42* | 1.58 |
| Fringes | 68.09 | 1.30 | 2.87* | 1.29 |
| Big City | 63.99 | 1.93 | -1.83 | 1.65 |
| Medium City | 72.34 | 2.35 | 6.52* | 2.34 |
| Small Place | 64.22 | 0.93 | -1.60 | 0.81 |
| 10th Grade | 49.99 | 1.27 | -15.82* | 1.00 |
| 11th Grade | 68.58 | 0.72 | 2.76* | 0.24 |
| 12th Grade | 69.60 | 1.26 | 3.78* | 1.21 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Computation With Decimals (18 Exercises) | | | |
|--------------------------|--|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 75.22 | 0.68 | | |
| Northeast | 78.39 | -1.35 | 3.17* | 1.20 |
| Central | 77.85 | 1.24 | 2.62* | 0.99 |
| West | 72.06 | 1.18 | -3.17* | 1.08 |
| Southeast | 71.35 | 1.70 | -3.87* | 1.49 |
| Male | 74.42 | 0.78 | -0.81* | 0.32 |
| Female | 75.98 | 0.72 | 0.76* | 0.31 |
| White | 78.51 | 0.58 | 3.29* | 0.41 |
| Hispanic | 64.71 | 2.29 | -10.51* | 2.04 |
| Black | 54.72 | 1.42 | -20.51* | 1.23 |
| Post High School | 80.22 | 0.68 | 4.99* | 0.40 |
| Grad. High School | 73.37 | 0.88 | -1.85* | 0.47 |
| Not Grad. High School | 66.36 | 1.12 | -8.87* | 0.96 |
| Advantaged | | | | |
| Urban | 82.05 | 1.24 | 6.82* | 1.31 |
| Disadvantaged | | | | |
| Urban | 61.49 | 1.22 | -13.73* | 1.39 |
| Extreme Rural | 74.03 | 1.46 | -1.19 | 1.40 |
| Fringes | 77.05 | 1.22 | 1.83 | 1.17 |
| Big City | 71.72 | 1.71 | -3.51* | 1.47 |
| Medium City | 82.35 | 1.33 | 7.12* | 1.42 |
| Small Place | 74.74 | 0.90 | -0.48 | 0.70 |
| 10th Grade | 62.22 | 1.38 | -13.00* | 1.03 |
| 11th Grade | 77.51 | 0.74 | 2.28* | 0.29 |
| 12th Grade | 78.84 | 1.10 | 3.62* | 1.14 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Computation With Integers | | (21 Exercises) | |
|--------------------------|---------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 68.09 | 0.91 | | |
| Northeast | 72.94 | 1.70 | 4.85* | 1.54 |
| Central | 70.79 | 1.51 | 2.70* | 1.28 |
| West | 64.98 | 2.24 | -3.11 | 1.80 |
| Southeast | 61.99 | 1.44 | -6.10* | 1.44 |
| Male | 68.57 | 1.05 | 0.48 | 0.42 |
| Female | 67.65 | 0.94 | -0.44 | 0.40 |
| White | 71.38 | 0.88 | 3.29* | 0.36 |
| Hispanic | 53.48 | 2.80 | -14.61* | 2.43 |
| Black | 48.19 | 1.48 | -19.90* | 1.45 |
| Post High School | 77.39 | 0.82 | 9.29* | 0.43 |
| Grad. High School | 63.27 | 0.92 | -4.82* | 0.62 |
| Not Grad. High School | 52.04 | 1.53 | -16.06* | 1.23 |
| Advantaged | | | | |
| Urban | 81.92 | 1.89 | 13.83* | 1.92 |
| Disadvantaged | | | | |
| Urban | 52.78 | 2.14 | -15.31* | 2.24 |
| Extreme Rural | 60.74 | 1.84 | -7.35 | 1.74 |
| Fringes | 73.94 | 1.58 | 5.85* | 1.58 |
| Big City | 67.10 | 2.31 | -0.99 | 2.06 |
| Medium City | 77.57 | 2.61 | 9.48* | 2.50 |
| Small Place | 63.87 | 1.26 | -4.22* | 1.02 |
| 10th Grade | 50.89 | 1.40 | -17.20* | 0.99 |
| 11th Grade | 71.15 | 0.91 | 3.06* | 0.25 |
| 12th Grade | 72.71 | 1.45 | 4.62* | 1.20 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Measurement Skills | | (21 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 56.72 | 0.68 | | |
| Northeast | 58.86 | 1.18 | 2.14 | 1.09 |
| Central | 61.16 | 1.37 | 4.44* | 1.03 |
| West | 54.02 | 1.44 | -2.70* | 1.26 |
| Southeast | 50.53 | 1.20 | -6.19* | 1.21 |
| Male | 61.65 | 0.77 | 4.93* | 0.31 |
| Female | 52.07 | 0.70 | -4.65* | 0.29 |
| White | 60.46 | 0.57 | 3.74* | 0.32 |
| Hispanic | 43.52 | 1.21 | -13.20* | 1.32 |
| Black | 33.26 | 0.86 | -23.46* | 0.85 |
| Post High School | 63.04 | 0.78 | 6.32* | 0.33 |
| Grad. High School | 54.28 | 0.63 | -2.44* | 0.32 |
| Not Grad. High School | 44.93 | 0.70 | -11.79* | 0.68 |
| Advantaged Urban | 65.06 | 0.86 | 8.34* | 0.36 |
| Disadvantaged Urban | 39.02 | 1.65 | -17.70* | 1.30 |
| Extreme Rural | 56.90 | 1.69 | 0.18 | 1.59 |
| Fringes | 58.59 | 1.01 | 1.87 | 0.96 |
| Big City | 53.35 | 1.99 | -3.37* | 1.60 |
| Medium City | 59.98 | 1.67 | 3.26 | 1.66 |
| Small Place | 56.91 | 0.80 | 0.19 | 0.64 |
| 10th Grade | 44.67 | 1.04 | -12.05* | 0.76 |
| 11th Grade | 59.07 | 0.72 | 2.35* | 0.24 |
| 12th Grade | 59.79 | 0.77 | 3.17* | 0.97 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| Reading Graphs and Tables (29 Exercises) | | | | |
|--|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 72.56 | 0.48 | | |
| Northeast | 73.34 | 0.86 | 0.78 | 0.78 |
| Central | 76.03 | 0.64 | 3.47* | 0.58 |
| West | 70.38 | 1.25 | -2.18* | 1.02 |
| Southeast | 68.78 | 0.93 | -3.77* | 0.38 |
| Male | 73.20 | 0.60 | 0.64* | 0.32 |
| Female | 72.00 | 0.52 | -0.56 | 0.30 |
| White | 75.42 | 0.40 | 2.86* | 0.30 |
| Hispanic | 61.80 | 0.93 | -10.75* | 0.95 |
| Black | 55.96 | 0.97 | -16.60* | 0.90 |
| Post High School | 77.62 | 0.45 | 5.06* | 0.32 |
| Grad. High School | 70.16 | 0.58 | -2.40* | 0.43 |
| Not Grad. High School | 63.79 | 0.85 | -8.77* | 0.73 |
| Advantaged | | | | |
| Urban | 79.38 | 0.71 | 6.82* | 0.85 |
| Disadvantaged | | | | |
| Urban | 59.48 | 2.06 | -13.08* | 1.95 |
| Extreme Rural | 72.90 | 0.93 | 0.34 | 0.99 |
| Fringes | 74.50 | 0.78 | 1.94* | 0.70 |
| Big City | 70.00 | 1.34 | -2.56* | 1.12 |
| Medium City | 76.05 | 1.21 | 3.50* | 1.24 |
| Small Place | 72.24 | 0.62 | -0.32 | 0.53 |
| 10th Grade | 59.11 | 1.03 | -13.44* | 0.93 |
| 11th Grade | 74.91 | 0.45 | 2.36 | 0.21 |
| 12th Grade | 76.97 | 0.84 | 4.42 | 0.90 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Geometric Manipulation | | (15 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 54.76 | 0.71 | | |
| Northeast | 55.22 | 1.16 | 0.46 | 1.10 |
| Central | 59.73 | 1.36 | .97* | 1.12 |
| West | 53.57 | 1.35 | -1.19 | 1.20 |
| Southeast | 47.86 | 0.72 | -6.90* | 0.94 |
| Male | 57.86 | 0.71 | 3.10* | 0.40 |
| Female | 51.79 | 0.89 | -2.98* | 0.38 |
| White | 57.00 | 0.66 | 3.13* | 0.35 |
| Hispanic | 41.72 | 1.41 | -13.04* | 1.55 |
| Black | 35.87 | 1.07 | -18.39* | 0.96 |
| Post High School | 60.50 | 0.80 | 5.74* | 0.42 |
| Grad. High School | 52.60 | 0.91 | -2.16* | 0.66 |
| Not Grad. High School | 43.97 | 1.11 | -10.80* | 1.05 |
| Advantaged | | | | |
| Urban | 64.53 | 1.33 | 9.77* | 1.41 |
| Disadvantaged | | | | |
| Urban | 41.17 | 1.67 | -13.59* | 1.82 |
| Extreme Rural | 53.56 | 1.23 | -1.20 | 1.16 |
| Fringes | 57.92 | 1.17 | 3.16* | 1.08 |
| Big City | 52.39 | 1.92 | -2.37 | 1.58 |
| Medium City | 58.68 | 2.70 | 3.92 | 2.62 |
| Small Place | 53.54 | 0.88 | -1.22 | 0.74 |
| 10th Grade | 43.22 | 1.37 | -11.54* | 1.02 |
| 11th Grade | 56.88 | 0.74 | 2.12* | 0.28 |
| 12th Grade | 57.87 | 1.22 | 3.11* | 1.16 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Algebraic Manipulation | | (59 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 39.99 | 0.59 | | |
| Northeast | 44.79 | 1.63 | 4.80* | 1.33 |
| Central | 41.56 | 1.05 | 1.58 | 0.86 |
| West | 37.21 | 0.99 | -2.78* | 0.91 |
| Southeast | 35.39 | 0.66 | -4.60* | 0.79 |
| Male | 40.89 | 0.70 | 0.90* | 0.26 |
| Female | 39.14 | 0.58 | -0.85* | 0.25 |
| White | 42.46 | 0.58 | 2.47* | 0.24 |
| Hispanic | 28.49 | 0.70 | -11.50* | 0.80 |
| Black | 25.05 | 0.68 | -14.94* | 0.69 |
| Post High School | 46.95 | 0.64 | 6.96* | 0.25 |
| Grad. High School | 36.19 | 0.57 | -3.80* | 0.32 |
| Not Grad. High School | 28.83 | 0.55 | -11.16* | 0.52 |
| Advantaged Urban | 51.45 | 1.63 | 11.46* | 1.61 |
| Disadvantaged Urban | 28.34 | 1.10 | -11.65* | 1.17 |
| Extreme Rural | 35.24 | 0.80 | -4.75* | 0.98 |
| Fringes | 44.34 | 1.27 | 4.36* | 1.16 |
| Big City | 39.16 | 1.41 | -0.83 | 1.20 |
| Medium City | 45.63 | 2.72 | 5.64* | 2.60 |
| Small Place | 37.05 | 0.52 | -2.94* | 0.59 |
| 10th Grade | 27.08 | 0.65 | -12.91* | 0.54 |
| 11th Grade | 41.93 | 0.62 | 1.94* | 0.18 |
| 12th Grade | 46.17 | 0.98 | 6.18* | 0.74 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Solving Equations | | (16 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 35.20 | 0.67 | | |
| Northeast | 41.62 | 1.75 | 6.41* | 1.43 |
| Central | 36.32 | 1.31 | 1.12 | 1.04 |
| West | 32.37 | 1.07 | -2.83* | 1.02 |
| Southeast | 29.67 | 0.75 | -5.54* | 0.89 |
| Male | 35.88 | 0.81 | 0.68 | 0.40 |
| Female | 34.56 | 0.75 | -0.64 | 0.39 |
| White | 38.05 | 0.66 | 2.84* | 0.28 |
| Hispanic | 23.02 | 1.12 | -12.19* | 1.24 |
| Black | 17.95 | 0.91 | -17.25* | 0.88 |
| Post High School | 42.80 | 0.73 | 7.59* | 0.28 |
| Grad. High School | 31.10 | 0.62 | -4.10* | 0.40 |
| Not Grad. High School | 22.68 | 0.33 | -12.52* | 0.67 |
| Advantaged Urban | 48.18 | 2.17 | 12.98* | 2.12 |
| Disadvantaged Urban | 21.64 | 1.52 | -13.56* | 1.58 |
| Extreme Rural | 29.88 | 1.06 | -5.32* | 1.14 |
| Fringes | 39.50 | 1.42 | 4.30* | 1.27 |
| Big City | 33.92 | 1.91 | -1.28 | 1.57 |
| Medium City | 40.14 | 3.67 | 4.93 | 3.59 |
| Small Place | 32.44 | 0.64 | -2.77* | 0.82 |
| 10th Grade | 20.55 | 0.92 | -14.66* | 0.70 |
| 11th Grade | 37.36 | 0.71 | 2.16* | 0.21 |
| 12th Grade | 42.06 | 1.13 | 6.85* | 1.01 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| Simplifying and Factoring (11 Exercises) | | | | |
|--|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 32.90 | 0.83 | | |
| Northeast | 41.13 | 2.41 | 8.24* | 1.95 |
| Central | 33.18 | 1.29 | 0.28 | 1.14 |
| West | 29.18 | 1.52 | -3.71* | 1.35 |
| Southeast | 27.50 | 0.78 | -5.40* | 1.01 |
| Male | 32.59 | 1.06 | -0.30 | 0.46 |
| Female | 33.19 | 0.81 | 0.29 | 0.44 |
| White | 35.28 | 0.86 | 2.38* | 0.32 |
| Hispanic | 19.56 | 1.70 | -13.34* | 1.75 |
| Black | 18.54 | 1.19 | -14.36* | 1.14 |
| Post High School | 41.94 | 1.00 | 9.04* | 0.53 |
| Grad. High School | 27.46 | 0.87 | -5.44* | 0.46 |
| Not Grad. High School | 19.68 | 1.07 | -13.22* | 1.24 |
| Advantaged | | | | |
| Urban | 47.16 | 2.69 | 14.26* | 2.65 |
| Disadvantaged | | | | |
| Urban | 20.94 | 1.52 | -11.96* | 1.63 |
| Extreme Rural | 24.72 | 1.04 | -8.17* | 1.06 |
| Fringes | 38.43 | 1.93 | 5.54* | 1.78 |
| Big City | 32.50 | 1.84 | -0.39 | 1.63 |
| Medium City | 41.50 | 3.93 | 8.60* | 3.80 |
| Small Place | 28.77 | 0.78 | -4.12* | 0.78 |
| 10th Grade | 16.99 | 1.06 | -15.90* | 1.11 |
| 11th Grade | 35.31 | 0.94 | 2.41* | 0.31 |
| 12th Grade | 40.66 | 1.68 | 7.76* | 1.45 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

Graphing Equalities and Inequalities (12 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|--------------------------|--------------------|-------------------|---|-------------------|
| Nation | 21.66 | 0.52 | | |
| Northeast | 24.66 | 1.29 | 3.00* | 1.07 |
| Central | 23.17 | 0.93 | 1.51* | 0.76 |
| West | 18.83 | 0.87 | -2.83* | 0.80 |
| Southeast | 19.13 | 0.81 | -2.52* | 0.81 |
| Male | 23.17 | 0.68 | 1.52* | 0.32 |
| Female | 20.21 | 0.52 | -1.45* | 0.30 |
| White | 23.18 | 0.56 | 1.53* | 0.17 |
| Hispanic | 11.87 | 0.86 | -9.79* | 0.89 |
| Black | 13.13 | 0.54 | -8.53* | 0.64 |
| Post High School | 27.23 | 0.69 | 5.57* | 0.34 |
| Grad. High School | 17.68 | 0.62 | -3.98* | 0.46 |
| Not Grad. High School | 14.60 | 0.62 | -7.06* | 0.60 |
| Advantaged | | | | |
| Urban | 31.26 | 1.54 | 9.61* | 1.48 |
| Disadvantaged | | | | |
| Urban | 13.90 | 0.56 | -7.76* | 0.78 |
| Extreme Rural | 18.79 | 0.70 | -2.86* | 0.80 |
| Fringes | 25.45 | 1.10 | 3.79* | 0.37 |
| Big City | 21.38 | 0.96 | -0.27 | 0.95 |
| Medium City | 27.46 | 2.52 | 5.81* | 2.41 |
| Small Place | 18.45 | 0.52 | -3.21* | 0.52 |
| 10th Grade | 13.30 | 0.70 | -8.36* | 0.80 |
| 11th Grade | 22.79 | 0.55 | 1.13* | 0.16 |
| 12th Grade | 26.62 | 1.22 | 4.96* | 0.93 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Estimation | | (22 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 49.63 | 0.63 | | |
| Northeast | 52.43 | 1.25 | 2.81* | 1.10 |
| Central | 52.90 | 1.35 | 3.28* | 1.00 |
| West | 46.28 | 0.98 | -3.35* | 0.95 |
| Southeast | 45.12 | 0.89 | -4.51* | 0.93 |
| Male | 52.96 | 0.68 | 3.34* | 0.31 |
| Female | 46.47 | 0.71 | -3.15* | 0.31 |
| White | 52.39 | 0.59 | 3.26* | 0.30 |
| Hispanic | 38.00 | 1.56 | -11.62* | 1.65 |
| Black | 30.12 | 0.90 | -19.51* | 0.98 |
| Post High School | 56.37 | 0.69 | 6.74* | 0.36 |
| Grad. High School | 46.24 | 0.69 | -3.39* | 0.50 |
| Not Grad. High School | 38.08 | 0.83 | -11.55* | 0.74 |
| Advantaged Urban | 60.12 | 1.57 | 10.49* | 1.49 |
| Disadvantaged Urban | 35.20 | 1.59 | -14.42* | 1.67 |
| Extreme Rural | 47.39 | 1.39 | -1.74 | 1.44 |
| Fringes | 52.85 | 1.35 | 3.22* | 1.13 |
| Big City | 46.71 | 1.54 | -2.91* | 1.31 |
| Medium City | 55.02 | 1.61 | 5.39* | 1.69 |
| Small Place | 48.37 | 0.81 | -1.26 | 0.72 |
| 10th Grade | 36.16 | 0.98 | -13.46* | 0.79 |
| 11th Grade | 51.98 | 0.68 | 2.36* | 0.21 |
| 12th Grade | 53.90 | 1.11 | 4.27* | 1.05 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Mathematical Understanding (105 Exercises) | | | |
|--------------------------|--|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 58.01 | 0.53 | | |
| Northeast | 60.40 | 0.96 | 2.38* | 0.98 |
| Central | 61.12 | 1.10 | 3.10* | 0.31 |
| West | 55.26 | 0.96 | -2.76* | 0.88 |
| Southeast | 53.78 | 0.74 | -4.23* | 0.78 |
| Male | 59.86 | 0.57 | 1.84* | 0.20 |
| Female | 56.24 | 0.57 | -1.77* | 0.20 |
| White | 61.01 | 0.48 | 3.00* | 0.25 |
| Hispanic | 44.20 | 0.90 | -13.82* | 0.87 |
| Black * | 40.65 | 0.59 | -17.36* | 0.61 |
| Post High School | 64.63 | 0.51 | 6.62* | 0.20 |
| Grad. High School | 55.02 | 0.51 | -3.00* | 0.34 |
| Not Grad. High School | 46.50 | 0.59 | -11.51* | 0.57 |
| Advantaged | | | | |
| Urban | 68.37 | 0.92 | 10.36* | 0.95 |
| Disadvantaged | | | | |
| Urban | 45.17 | 1.36 | -12.84* | 1.47 |
| Extreme Rural | 55.75 | 1.04 | -2.26* | 1.01 |
| Fringes | 61.52 | 0.95 | 3.50* | 0.85 |
| Big City | 55.80 | 1.36 | -2.22* | 1.10 |
| Medium City | 60.86 | 1.70 | 2.35* | 1.64 |
| Small Place | 56.71 | 0.63 | -1.30* | 0.56 |
| 10th Grade | 44.88 | 0.72 | -13.13* | 0.52 |
| 11th Grade | 60.26 | 0.57 | 2.24* | 0.16 |
| 12th Grade | 62.59 | 0.68 | 4.58* | 0.66 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| Mathematical Applications (136 Exercises) | | | | |
|---|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 43.48 | 0.49 | | |
| Northeast | 46.05 | 0.91 | 2.57* | 0.82 |
| Central | 46.61 | 1.04 | 3.13* | 0.76 |
| West | 41.34 | 0.97 | -2.14* | 0.30 |
| Southeast | 38.26 | 0.65 | -5.23* | 0.74 |
| Male | 46.06 | 0.53 | 2.58* | 0.22 |
| Female | 41.02 | 0.52 | -2.47* | 0.21 |
| White | 46.45 | 0.43 | 2.97* | 0.24 |
| Hispanic | 31.39 | 0.67 | -12.10* | 0.78 |
| Black | 25.66 | 0.46 | -17.82* | 0.54 |
| Post High School | 49.67 | 0.50 | 6.18* | 0.19 |
| Grad. High School | 40.47 | 0.41 | -3.01* | 0.30 |
| Not Grad. High School | 32.65 | 0.47 | -10.33* | 0.50 |
| Advantaged | | | | |
| Urban | 53.42 | 1.28 | 9.94* | 1.20 |
| Disadvantaged | | | | |
| Urban | 30.72 | 1.30 | -12.76* | 1.41 |
| Extreme Rural | 41.29 | 1.16 | -2.20 | 1.12 |
| Fringes | 47.25 | 0.94 | 3.77* | 0.84 |
| Big City | 41.08 | 1.36 | -2.40* | 1.11 |
| Medium City | 47.13 | 1.60 | 3.64* | 1.60 |
| Small Place | 42.01 | 0.56 | -1.47* | 0.55 |
| 10th Grade | 30.77 | 0.60 | -12.72* | 0.46 |
| 11th Grade | 45.44 | 0.54 | 1.96* | 0.14 |
| 12th Grade | 48.98 | 0.67 | 5.50* | 0.63 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Routine Problems | | (114 Exercises) | |
|--------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 41.55 | 0.50 | | |
| Northeast | 44.29 | 0.95 | 2.75* | 0.85 |
| Central | 44.78 | 1.05 | 3.24* | 0.77 |
| West | 39.28 | 0.90 | -2.26* | 0.32 |
| Southeast | 36.09 | 0.70 | -5.46* | 0.78 |
| Male | 44.13 | 0.36 | 2.59* | 0.24 |
| Female | 39.07 | 0.34 | -2.48* | 0.24 |
| White | 44.60 | 0.44 | 3.06* | 0.25 |
| Hispanic | 29.24 | 0.66 | -12.31* | 0.78 |
| Black | 23.03 | 0.51 | -18.52* | 0.56 |
| Post High School | 47.98 | 0.50 | 6.44* | 0.20 |
| Grad. High School | 38.40 | 0.44 | -3.14* | 0.32 |
| Not Grad, High School | 30.37 | 0.51 | -11.18* | 0.52 |
| Advantaged | | | | |
| Urban | 51.99 | 1.26 | 10.44* | 1.21 |
| Disadvantaged | | | | |
| Urban | 28.35 | 1.39 | -13.20* | 1.49 |
| Extreme Rural | 39.36 | 1.20 | -2.18 | 1.16 |
| Pringes | 45.37 | 0.94 | 4.03* | 0.86 |
| Big City | 38.98 | 1.42 | -2.57* | 1.16 |
| Medium City | 45.71 | 1.66 | 4.16* | 1.66 |
| Small Place | 39.90 | 0.58 | -1.64* | 0.57 |
| 10th Grade | 28.34 | 0.64 | -13.21* | 0.48 |
| 11th Grade | 43.56 | 0.54 | 2.01* | 0.15 |
| 12th Grade | 47.45 | 0.68 | 5.90* | 0.63 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | One-Step Word Problems | | (20 Exercises) | |
|--------------------------|------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 57.09 | 0.54 | | |
| Northeast | 60.31 | 1.05 | 3.23* | 0.92 |
| Central | 60.86 | 0.94 | 3.77* | 0.75 |
| West | 54.63 | 1.08 | -2.46* | 0.95 |
| Southeast | 50.44 | 1.20 | -6.65* | 1.12 |
| Male | 59.71 | 0.53 | 2.63* | 0.31 |
| Female | 54.56 | 0.68 | -2.53 | 0.30 |
| White | 60.64 | 0.42 | 3.56* | 0.33 |
| Hispanic | 43.89 | 1.09 | -13.20* | 1.08 |
| Black | 35.38 | 1.06 | -21.71* | 0.95 |
| Post High School | 63.46 | 0.53 | 6.37* | 0.28 |
| Grad. High School | 54.23 | 0.52 | -2.86* | 0.38 |
| Not Grad. High School | 46.17 | 0.93 | -10.92* | 0.80 |
| Advantaged | | | | |
| Urban | 65.93 | 1.13 | 8.84* | 1.18 |
| Disadvantaged | | | | |
| Urban | 41.48 | 2.16 | -15.60* | 2.13 |
| Extreme Rural | 55.33 | 1.24 | -1.76 | 1.22 |
| Fringes | 60.33 | 0.87 | 3.24* | 0.90 |
| Big City | 53.17 | 1.66 | -3.92* | 1.40 |
| Medium City | 62.82 | 1.33 | 5.73* | 1.46 |
| Small Place | 56.30 | 0.75 | -0.79 | 0.63 |
| 10th Grade | 41.51 | 1.05 | -15.58* | 0.81 |
| 11th Grade | 59.72 | 0.52 | 2.63* | 0.18 |
| 12th Grade | 62.23 | 1.00 | 5.14* | 0.87 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Multistep Word Problems | | (30 Exercises) | |
|--------------------------|-------------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 35.10 | 0.51 | | |
| Northeast | 37.88 | 1.12 | 2.79* | 0.96 |
| Central | 37.76 | 1.10 | 2.66* | 0.81 |
| West | 32.55 | 0.84 | -2.55* | 0.80 |
| Southeast | 30.98 | 0.81 | -4.12* | 0.84 |
| Male | 37.64 | 0.67 | 2.54* | 0.40 |
| Female | 32.66 | 0.62 | -2.43* | 0.40 |
| White | 38.32 | 0.48 | 3.22* | 0.28 |
| Hispanic | 22.47 | 0.92 | -12.63* | 1.00 |
| Black | 15.93 | 0.65 | -19.17* | 0.73 |
| Post High School | 41.64 | 0.61 | 6.54* | 0.31 |
| Grad. High School | 31.84 | 0.55 | -3.25* | 0.44 |
| Not Grad. High School | 23.38 | 0.71 | -11.72* | 0.76 |
| Advantaged | | | | |
| Urban | 46.11 | 1.66 | 11.01* | 1.53 |
| Disadvantaged | | | | |
| Urban | 21.56 | 1.37 | -13.54* | 1.50 |
| Extreme Rural | 33.85 | 1.36 | -1.24 | 1.37 |
| Fringes | 38.60 | 1.05 | 3.51* | 0.90 |
| Big City | 32.11 | 1.41 | -2.99* | 1.18 |
| Medium City | 40.33 | 1.73 | 5.23* | 1.76 |
| Small Place | 33.65 | 0.62 | -1.44* | 0.64 |
| 10th Grade | 21.40 | 0.64 | -13.70* | 0.62 |
| 11th Grade | 37.14 | 0.61 | 2.04* | 0.22 |
| 12th Grade | 41.71 | 1.05 | 6.62* | 1.08 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

Graph and Table Problems (15 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 63.19 | 0.66 | | |
| Northeast | 66.08 | 0.91 | 2.89* | 0.94 |
| Central | 66.92 | 1.17 | 3.73* | 0.89 |
| West | 61.56 | 1.71 | -1.63* | 1.41 |
| Southeast | 55.79 | 0.72 | -7.40* | 0.88 |
| Male | 64.86 | 0.81 | 1.67* | 0.41 |
| Female | 61.58 | 0.75 | -1.62* | 0.39 |
| White | 67.04 | 0.59 | 3.85* | 0.36 |
| Hispanic | 46.27 | 1.64 | -16.92* | 1.71 |
| Black | 40.91 | 1.10 | -22.28* | 1.11 |
| Post High School | 70.02 | 0.62 | 6.83* | 0.32 |
| Grad. High School | 60.73 | 0.65 | -2.47* | 0.46 |
| Not Grad. High School | 50.85 | 1.01 | -12.34* | 0.99 |
| Advantaged Urban | 72.56 | 1.11 | 9.37* | 1.25 |
| Disadvantaged Urban | 50.24 | 2.81 | -12.96* | 2.80 |
| Extreme Rural | 59.74 | 2.14 | -3.46 | 1.98 |
| Fringes | 68.58 | 0.86 | 5.39* | 0.82 |
| Big City | 59.51 | 1.76 | -3.69* | 1.44 |
| Medium City | 65.74 | 2.00 | 2.54 | 1.96 |
| Small Place | 61.71 | 0.91 | -1.49 | 0.76 |
| 10th Grade | 47.66 | 1.14 | -15.53* | 0.84 |
| 11th Grade | 65.73 | 0.67 | 2.53* | 0.25 |
| 12th Grade | 70.59 | 1.26 | 7.39* | 1.20 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| | Geometric Problems | | (18 Exercises) | |
|-----------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 36.77 | 0.65 | | |
| Northeast | 39.03 | 1.04 | 2.26* | 0.99 |
| Central | 40.14 | 1.53 | 3.38* | 1.09 |
| West | 34.40 | 1.11 | -2.36* | 1.04 |
| Southeast | 31.70 | 0.80 | -5.07* | 0.92 |
| Male | 40.04 | 0.73 | 3.27* | 0.32 |
| Female | 33.69 | 0.69 | -3.08* | 0.30 |
| White | 39.24 | 0.63 | 2.47* | 0.24 |
| Hispanic | 25.30 | 1.14 | -11.47* | 1.27 |
| Black | 20.82 | 0.89 | -15.94* | 0.91 |
| Post High School | 43.72 | 0.70 | 6.95* | 0.29 |
| Grad. High School | 32.93 | 0.64 | -3.84* | 0.44 |
| Not Grad. High School | 25.85 | 0.84 | -10.92* | 0.77 |
| Advantaged Urban | 47.75 | 1.61 | 10.98* | 1.49 |
| Disadvantaged Urban | 24.00 | 1.15 | -12.76* | 1.30 |
| Extreme Rural | 33.62 | 1.42 | -3.15* | 1.37 |
| Fringes | 41.96 | 1.46 | 5.20* | 1.24 |
| Big City | 35.20 | 1.50 | -1.56 | 1.26 |
| Medium City | 39.85 | 2.84 | 3.08 | 2.69 |
| Small Place | 34.24 | 0.66 | -2.53* | 0.66 |
| 10th Grade | 25.25 | 0.91 | -11.52* | 0.73 |
| 11th Grade | 38.54 | 0.67 | 1.78* | 0.18 |
| 12th Grade | 41.34 | 1.31 | 4.57* | 1.06 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentages
1978

| Measurement Problems (13 Exercises) | | | | |
|-------------------------------------|--------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 33.08 | 0.70 | | |
| Northeast | 35.87 | 1.46 | 2.80* | 1.28 |
| Central | 37.31 | 1.51 | 4.24* | 1.11 |
| West | 30.80 | 1.03 | -2.28* | 1.01 |
| Southeast | 26.26 | 1.25 | -6.81* | 1.25 |
| Male | 36.97 | 0.88 | 3.90* | 0.38 |
| Female | 29.33 | 0.69 | -3.75* | 0.39 |
| White | 36.29 | 0.68 | 3.22* | 0.28 |
| Hispanic | 20.92 | 1.07 | -12.15* | 1.18 |
| Black | 13.38 | 0.80 | -19.69* | 0.86 |
| Post High School | 40.33 | 0.82 | 7.25* | 0.37 |
| Grad. High School | 29.33 | 0.70 | -3.74* | 0.49 |
| Not Grad. High School | 20.24 | 0.69 | -12.84* | 0.80 |
| Advantaged Urban | 46.88 | 2.11 | 13.80* | 1.83 |
| Disadvantaged Urban | 17.54 | 1.48 | -15.54* | 1.68 |
| Extreme Rural | 31.08 | 1.47 | -1.99 | 1.45 |
| Fringes | 37.72 | 1.73 | 4.65* | 1.44 |
| Big City | 30.66 | 1.77 | -2.41 | 1.48 |
| Medium City | 36.92 | 2.34 | 3.84 | 2.34 |
| Small Place | 31.14 | 0.77 | -1.94* | 0.81 |
| 10th Grade | 20.05 | 1.05 | -13.03* | 0.91 |
| 11th Grade | 34.91 | 0.80 | 1.83* | 0.25 |
| 12th Grade | 39.85 | 1.18 | 6.77* | 1.12 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentage
1978

| | Nonroutine Problems | | (10 Exercises) | |
|-----------------------------|---------------------|-------------------|---|-------------------|
| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | 40.49 | 0.78 | | |
| Northeast | 42.78 | 1.37 | 2.29 | 1.26 |
| Central | 43.41 | 1.88 | 2.92* | 1.31 |
| West | 38.88 | 0.90 | -1.61 | 1.03 |
| Southeast | 35.14 | 0.89 | -5.35* | 1.05 |
| Male | 43.76 | 0.99 | 3.27* | 0.41 |
| Female | 37.34 | 0.75 | -3.15* | 0.42 |
| White | 43.43 | 0.76 | 2.94* | 0.28 |
| Hispanic | 27.98 | 2.36 | -12.51* | 2.42 |
| Black | 23.40 | 0.94 | -17.09* | 1.12 |
| Post High School | 46.67 | 0.97 | 6.18* | 0.48 |
| Grad. High School | 37.73 | 0.80 | -2.76* | 0.64 |
| Not Grad. High School | 28.33 | 0.97 | -12.16* | 1.02 |
| Advantaged Urban | 50.13 | 2.78 | 9.64* | 2.28 |
| Disadvantaged Urban | 28.71 | 1.80 | -11.78* | 2.00 |
| Extreme Rural | 37.77 | 1.59 | -2.72 | 1.60 |
| Prizes | 43.85 | 1.61 | 3.36* | 1.16 |
| Big City | 38.62 | 1.87 | -1.87 | 1.43 |
| Medium City | 40.37 | 2.35 | -0.12 | 2.33 |
| Small Place | 39.83 | 0.80 | -0.66 | 0.84 |
| 10th Grade | 29.03 | 1.12 | -11.46* | 1.07 |
| 11th Grade | 42.43 | 0.86 | 1.94* | 0.28 |
| 12th Grade | 44.05 | 1.70 | 3.56* | 1.66 |

*Indicates mean percentages significantly different from
the nation at the .05 level.

TABLE 8 (Continued). Age 17 -- Mean Performance Percentage
1978

Combination, Statistics and
Probability Problems (13 Exercises)

| | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|-----------------------------|--------------------|-------------------|---|-------------------|
| Nation | 25.50 | 0.43 | | |
| Northeast | 27.06 | 1.03 | 1.56 | 0.88 |
| Central | 27.99 | 0.77 | 2.49* | 0.61 |
| West | 23.94 | 0.62 | -1.56* | 0.61 |
| Southeast | 21.91 | 0.87 | -3.59* | 0.81 |
| Male | 27.56 | 0.54 | 2.06* | 0.30 |
| Female | 23.52 | 0.49 | -1.98* | 0.29 |
| White | 27.46 | 0.45 | 1.97* | 0.21 |
| Hispanic | 18.56 | 0.86 | -6.94* | 0.95 |
| Black | 13.47 | 0.65 | -12.03* | 0.60 |
| Post High School | 29.80 | 0.60 | 4.30* | 0.33 |
| Grad. High School | 23.15 | 0.53 | -2.35* | 0.46 |
| Not Grad. High School | 18.15 | 0.69 | -7.35* | 0.70 |
| Advantaged Urban | 34.11 | 1.54 | 8.61* | 1.46 |
| Disadvantaged Urban | 17.46 | 0.90 | -8.04* | 0.94 |
| Extreme Rural | 24.52 | 1.07 | -0.98 | 1.00 |
| Fringes | 28.11 | 0.76 | 2.61* | 0.85 |
| Big City | 24.77 | 1.34 | -0.73 | 1.11 |
| Medium City | 28.50 | 0.68 | 3.00* | 0.71 |
| Small Place | 23.88 | 0.60 | -1.62* | 0.47 |
| 10th Grade | 17.27 | 0.72 | -8.23* | 0.63 |
| 11th Grade | 26.63 | 0.50 | 1.13* | 0.20 |
| 12th Grade | 29.41 | 1.11 | 3.91* | 1.05 |

*Indicates mean percentages significantly different
from the nation at the .05 level.

CHAPTER 4

PERFORMANCE FOR NONSTANDARD VARIABLE GROUPS FOR THE 1977-78 MATHEMATICS ASSESSMENT

In this chapter, data are presented and discussed for the variables that are not generally reported by National Assessment. These additional variables do not exhaust the possibilities for analysis of National Assessment data, but rather represent some work presently done that may be useful and of interest to readers of this report.

At age 9, data for two-way variables dealing with race or race/ethnicity are presented. The data presented are only for the sets of mathematical knowledge and skill exercises. Data for the other sets of exercises tended to have rather large standard errors for some groups and hence are not reported.

The data for 17-year-olds presented here do not include data for all the sets of exercises for which data were presented in the previous chapter. Again, a number of exercise sets have been excluded because of excessively large standard errors for small exercise sets. Some exercise sets at age 13 are not included but the same patterns of performance hold for them, as for the exercise sets that are reported for the use-of-the-calculator variable.

At age 9, the effects of sex seem about the same for both blacks and whites on the two exercise sets reported. The effects of grade in school seem about the same for blacks, Hispanics and whites.

There seem to be very different effects for type of community for blacks and whites at age 9. For whites, the disadvantaged-urban group is the poorest performing group, with performance 5 or 6% below the nation. For blacks, the extreme-rural group is the poorest performing group, with performance of 18 to 20% below the nation. For both blacks and whites, the advantaged-urban group had the highest performance.

For extreme-rural black 9-year-olds, 94% were also in the Southeastern region and 6% were in the Western region. On the other hand, for extreme-rural white 9-year-olds, 23% were in the Southeastern region, 14% in the Western region and 62% in the Central region. Since region of the country is related to performance, this may help explain the large performance deficit for blacks in rural areas.

Nine-year-old Hispanics and whites living in the Northeastern, Central, Western and Southeastern regions have similar patterns of performance to the national regional performance. Black 9-year-olds living in the Central and Western regions have approximately equal performances. The performance pattern

for blacks in the Northeast and the Southeast is the same as for the nation.

The use of electronic hand calculators appears to have had a different effect for 13-year-olds than for 17-year-olds. At age 17, the group that reported using hand calculators most often performed significantly better than the others across the exercise sets reported upon. However, for age 13, the groups that achieved the best were those who used calculators less than once a week and those who used calculators once a month. The performances of these two groups were always significantly better than the nation and were frequently not significantly different from each other. At age 13, the group that reported the most calculator use was usually not significantly different from the nation in performance. At both ages 13 and 17, the group of students that said they had never used a calculator was consistently the poorest in performance. This group was significantly below the nation and the other three groups in performance. At age 17, the performance of the groups was directly related to the amount of calculator use reported. Some caution should be exercised in looking at the data, since it may be related to access to calculators, which is probably related to socioeconomic status or the respondent and/or respondent's school.

The results for performance related to the number of hours 17-year-olds reported watching television were not surprising. The two groups (less than one hour and one-two hours) that reported watching TV two hours or less last night consistently did the best on the exercises assessed. Those watching TV five hours or more last night were significantly below the other groups and the nation in average performance across all exercises. Those who reported watching TV three to four hours a night were significantly below the nation on all exercise sets except whole number computation.

The course-taking variable for 17-year-olds is related to the average performance in a predictable fashion. Those who had taken more mathematics courses always performed better than those with fewer courses in mathematics. It is interesting to note the large increase in average performance on the geometry knowledge exercises for those who had taken Geometry over those who stopped at Algebra I. Again, some caution should be taken in attributing these results solely to the courses taken.

There were few large differences in average performance for 17-year-old males and females that have not taken Algebra I. Males in this group tended to perform about 2 percentage points better than females, with the exception of measurement skills and estimation skills, for which males were 8 and 5 percentage points higher than females. Females in this classification had the performance edge for some exercise sets, such as whole number computation. The difference between males' and females' performances grows, with males outperforming females as the level of course work increases to Geometry, Algebra II and greater than Algebra II. More exercise sets show large male performance advantages, and female performance advantages disappear altogether on the exercise sets reported. At age 17, the fact that fewer females than males take higher-level mathematics courses does not appear to explain the overall female deficit in performance at age 17.

Both black and white 17-year-olds show a rather wide range in performance when course-taking groups are compared. The effect of course taking seems to be roughly equivalent for the two races. Blacks who have taken more than Algebra II may be slightly further behind their white counterparts than blacks who have less than Algebra I are behind their white counterparts. Standard errors on some exercise sets are relatively large for blacks who have taken more than Algebra II.

TABLE 9. Age 9 Mean Performance Percentages 1977-78

| | | Mathematical Knowledge | | | |
|----------|---------------------|------------------------|-------------------|---|-------------------|
| | | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | | 65.94 | 0.44 | | |
| Male | Black | 53.27 | 0.88 | -12.66* | 0.93 |
| | White | 67.82 | 0.47 | 1.88* | 0.27 |
| Female | Black | 56.67 | 0.88 | - 9.26* | 0.89 |
| | White | 68.94 | 0.52 | 3.00* | 0.32 |
| Grade 3 | Black | 41.47 | 1.26 | -24.46* | 1.32 |
| | Hispanic | 44.79 | 1.18 | -21.15* | 1.14 |
| | White | 56.57 | 0.68 | - 9.36* | 0.53 |
| Grade 4 | Black | 59.76 | 0.84 | - 6.18* | 0.87 |
| | Hispanic | 62.80 | 1.17 | - 3.14* | 1.07 |
| | White | 72.30 | 0.49 | 6.36* | 0.31 |
| Black | Advantaged urban | 69.96 | 3.58 | 4.02. | 3.59 |
| | Disadvantaged urban | 52.70 | 1.73 | -13.24* | 1.74 |
| | Extreme rural | 45.48 | 3.22 | -20.45* | 3.30 |
| White | Advantaged urban | 75.22 | 0.80 | 9.28* | 0.87 |
| | Disadvantaged urban | 59.61 | 1.42 | - 6.33* | 1.39 |
| | Extreme rural | 65.35 | 1.25 | - 0.59 | 1.24 |
| Black | Northeast | 59.18 | 1.38 | - 6.76* | 1.38 |
| | Central | 55.16 | 2.78 | -10.78* | 2.72 |
| | West | 56.90 | 1.38 | - 9.04* | 1.40 |
| | Southeast | 51.89 | 1.12 | -14.05* | 1.21 |
| Hispanic | Northeast | 60.63 | 1.43 | - 5.31* | 1.42 |
| | Central | 59.99 | 3.80 | - 3.77 | 3.72 |
| | West | 55.75 | 1.35 | -10.19* | 1.29 |
| | Southeast | 47.35 | 3.94 | -18.59* | 3.93 |
| White | Northeast | 72.20 | 0.68 | 6.26* | 0.69 |
| | Central | 69.70 | 0.65 | 3.76* | 0.55 |
| | West | 65.43 | 1.17 | - 0.51 | 1.00 |
| | Southeast | 65.20 | 1.06 | - 0.74 | 1.02 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 9 (Continued). Age 9 Mean Performance Percentages 1977-78

| | | Mathematical Skills | | | |
|----------|---------------------|---------------------|-------------------|---|-------------------|
| | | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
| Nation | | 43.34 | 0.40 | | |
| Male | Black | 31.97 | 0.60 | -11.37* | 0.71 |
| | White | 45.48 | 0.41 | 2.15* | 0.26 |
| Female | Black | 33.19 | 0.59 | -10.15* | 0.66 |
| | White | 45.81 | 0.54 | 2.47* | 0.31 |
| Grade 3 | Black | 24.07 | 0.98 | -19.26* | 1.02 |
| | Hispanic | 26.79 | 1.28 | -16.55* | 1.31 |
| | White | 34.94 | 0.63 | - 8.40* | 0.48 |
| Grade 4 | Black | 35.56 | 0.52 | - 7.78* | 0.64 |
| | Hispanic | 39.82 | 1.12 | - 3.51* | 1.04 |
| | White | 49.13 | 0.47 | 5.79* | 0.30 |
| Black | Advantaged urban | 44.16 | 3.22 | 0.82 | 3.27 |
| | Disadvantaged urban | 31.82 | 1.18 | -11.51* | 1.23 |
| | Extreme rural | 25.20 | 2.44 | -18.13* | 2.50 |
| White | Advantaged urban | 52.82 | 1.00 | 9.49* | 1.04 |
| | Disadvantaged urban | 38.24 | 1.18 | - 5.09* | 1.09 |
| | Extreme rural | 43.50 | 1.57 | 0.16 | 1.54 |
| Black | Northeast | 36.10 | 0.94 | - 7.24* | 0.97 |
| | Central | 32.95 | 1.69 | -10.38* | 1.68 |
| | West | 33.34 | 1.37 | - 9.99* | 1.42 |
| | Southeast | 30.29 | 0.82 | -13.05* | 0.89 |
| Hispanic | Northeast | 38.96 | 1.75 | - 4.37* | 1.76 |
| | Central | 37.48 | 2.31 | - 5.25* | 2.23 |
| | West | 34.22 | 1.40 | - 9.12* | 1.36 |
| | Southeast | 31.07 | 5.56 | -12.27* | 5.51 |
| White | Northeast | 49.07 | 0.42 | 5.73* | 0.51 |
| | Central | 47.11 | 0.77 | 3.78* | 0.59 |
| | West | 42.95 | 0.97 | - 0.39 | 0.87 |
| | Southeast | 42.42 | 0.93 | - 0.91 | 0.90 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 10. Age 13 Mean Performance Percentages 1977-78

| | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|----------------------------|---------------------------|--|---------------------------|
| <u>Mathematical Knowledge (147 Exercises)</u> | | | | |
| Nation | 66.87 | 0.52 | | |
| Use hand calculator more than once/week | 66.50 | 0.66 | -0.38 | 0.33 |
| Use hand calculator less than once/week | 70.67 | 0.65 | 3.79* | 0.33 |
| Use hand calculator once/month | 70.64 | 0.54 | 3.77* | 0.35 |
| Never use hand calculator | 63.50 | 0.56 | -3.37* | 0.27 |
| <u>Numbers and Numeration (86 Exercises)</u> | | | | |
| Nation | 71.20 | 0.54 | | |
| Use hand calculator more than once/week | 70.62 | 0.72 | -0.57 | 0.39 |
| Use hand calculator less than once/week | 74.73 | 0.70 | 3.54* | 0.40 |
| Use hand calculator once/month | 75.01 | 0.57 | 3.81* | 0.35 |
| Never use hand calculator | 67.87 | 0.60 | -3.32* | 0.30 |
| <u>Geometry Knowledge (44 Exercises)</u> | | | | |
| Nation | 57.30 | 0.58 | | |
| Use hand calculator more than once/week | 57.08 | 0.69 | -0.22 | 0.40 |
| Use hand calculator less than once/week | 61.32 | 0.81 | 4.03* | 0.45 |
| Use hand calculator once/month | 60.89 | 0.77 | 3.59* | 0.53 |
| Never use hand calculator | 54.07 | 0.60 | -3.23* | 0.33 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 10 (Continued). Age 13 Mean Performance Percentages 1977-78

| | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|--|----------------------------|---------------------------|--|---------------------------|
| <u>Measurement Knowledge (17 Exercises)</u> | | | | |
| Nation | 69.79 | 0.71 | | |
| Use hand calculator more than once/week | 69.99 | 0.83 | 0.20 | 0.54 |
| Use hand calculator less than once/week | 74.28 | 1.03 | 4.49* | 0.77 |
| Use hand calculator once/month | 73.79 | 0.90 | 4.00* | 0.69 |
| Never use hand calculator | 65.79 | 0.93 | -3.99* | 0.55 |
| <u>Mathematical Skills (272 Exercises)</u> | | | | |
| Nation | 51.88 | 0.65 | | |
| Use hand calculator more than once/week | 51.36 | 0.82 | -0.53 | 0.38 |
| Use hand calculator less than once/week | 56.47 | 0.82 | 4.58* | 0.35 |
| Use hand calculator once/month | 55.99 | 0.65 | 4.11* | 0.34 |
| Never use hand calculator | 47.93 | 0.60 | -3.95* | 0.32 |
| <u>Computation (129 Exercises)</u> | | | | |
| Nation | 51.68 | 0.74 | | |
| Use hand calculator more than once/week | 50.60 | 0.96 | -1.08* | 0.46 |
| Use hand calculator less than once/week | 55.94 | 0.93 | 4.26* | 0.40 |
| Use hand calculator once/month | 56.22 | 0.78 | 4.54* | 0.41 |
| Never use hand calculator | 47.91 | 0.66 | -3.77* | 0.36 |
| <u>Whole Number Computation (20 Exercises)</u> | | | | |
| Nation | 82.67 | 0.49 | | |
| Use hand calculator more than once/week | 81.48 | 0.68 | -1.19* | 0.49 |
| Use hand calculator less than once/week | 85.14 | 0.67 | 2.47* | 0.45 |
| Use hand calculator once/month | 85.29 | 0.64 | 2.62* | 0.58 |
| Never use hand calculator | 80.66 | 0.63 | -2.01* | 0.34 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 10 (Continued) Age 13 Mean Performance Percentages 1977-78

| | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|----------------------------|---------------------------|--|---------------------------|
| <u>Measurement Skills (32 Exercises)</u> | | | | |
| Nation | 54.75 | 0.65 | | |
| Use hand calculator more than once/week | 54.95 | 0.79 | 0.20 | 0.48 |
| Use hand calculator less than once/week | 59.85 | 0.88 | 5.10* | 0.47 |
| Use hand calculator once/month | 59.59 | 0.77 | 4.84* | 0.53 |
| Never use hand calculator | 49.41 | 0.78 | -5.34* | 0.54 |
| <u>Reading Graphs and Tables (27 Exercises)</u> | | | | |
| Nation | 68.85 | 0.65 | | |
| Use hand calculator more than once/week | 68.59 | 0.95 | -0.26 | 0.64 |
| Use hand calculator less than once/week | 73.97 | 0.85 | 5.12* | 0.48 |
| Use hand calculator once/month | 72.16 | 0.71 | 3.31* | 0.50 |
| Never use hand calculator | 65.62 | 0.65 | -3.23* | 0.45 |
| <u>Geometric Manipulation (19 Exercises)</u> | | | | |
| Nation | 45.81 | 0.59 | | |
| Use hand calculator more than once/week | 46.30 | 0.72 | 0.49 | 0.51 |
| Use hand calculator less than once/week | 50.10 | 0.84 | 4.30* | 0.55 |
| Use hand calculator once/month | 48.47 | 0.78 | 2.66* | 0.52 |
| Never use hand calculator | 42.14 | 0.67 | -3.67* | 0.44 |
| <u>Algebraic Manipulation (43 Exercises)</u> | | | | |
| Nation | 52.17 | 0.72 | | |
| Use hand calculator more than once/week | 51.24 | 0.96 | -0.93* | 0.45 |
| Use hand calculator less than once/week | 57.55 | 0.94 | 5.38* | 0.51 |
| Use hand calculator once/month | 56.36 | 0.68 | 4.19* | 0.45 |
| Never use hand calculator | 48.08 | 0.75 | -4.09* | 0.39 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 10 (Continued). Age 13 Mean Performance Percentages 1977-78

| | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|----------------------------|---------------------------|--|---------------------------|
| <u>Estimation (22 Exercises)</u> | | | | |
| Nation | 32.75 | 0.55 | | |
| Use hand calculator more than once/week | 34.00 | 0.79 | 1.25 | 0.64 |
| Use hand calculator less than once/week | 36.54 | 1.03 | 3.78* | 0.82 |
| Use hand calculator once/month | 35.37 | 0.75 | 2.62* | 0.56 |
| Never use hand calculator | 28.88 | 0.70 | -3.87* | 0.42 |
| <u>Mathematical Understanding (108 Exercises)</u> | | | | |
| Nation | 51.72 | 0.49 | | |
| Use hand calculator more than once/week | 51.52 | 0.68 | -0.21 | 0.39 |
| Use hand calculator less than once/week | 56.11 | 0.58 | 4.39* | 0.35 |
| Use hand calculator once/month | 55.52 | 0.52 | 3.79* | 0.35 |
| Never use hand calculator | 48.00 | 0.54 | -3.73* | 0.32 |
| <u>Mathematical Application (106 Exercises)</u> | | | | |
| Nation | 43.34 | 0.50 | | |
| Use hand calculator more than once/week | 42.80 | 0.67 | -0.55 | 0.39 |
| Use hand calculator less than once/week | 47.13 | 0.67 | 3.79* | 0.38 |
| Use hand calculator once/month | 47.37 | 0.52 | 4.03* | 0.28 |
| Never use hand calculator | 39.79 | 0.52 | -3.55* | 0.30 |
| <u>Routine Problems (85 Exercises)</u> | | | | |
| Nation | 41.43 | 0.53 | | |
| Use hand calculator more than once/week | 40.98 | 0.71 | -0.45 | 0.42 |
| Use hand calculator less than once/week | 45.53 | 0.70 | 4.10* | 0.40 |
| Use hand calculator once/month | 45.58 | 0.56 | 4.15* | 0.29 |
| Never use hand calculator | 37.56 | 0.55 | -3.87* | 0.31 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11. Age 17 Mean Performance Percentages 1977-78

Mathematical Knowledge (140 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 71.71 | 0.45 | | |
| Female | Took less than Algebra I | 57.52 | 0.70 | -14.19* | 0.71 |
| | Took Algebra I | 65.27 | 0.50 | - 6.44* | 0.52 |
| | Took Geometry | 74.85 | 0.49 | 3.14* | 0.46 |
| | Took Algebra II | 78.88 | 0.56 | 7.17* | 0.60 |
| | Took more than Algebra II | 85.87 | 0.66 | 14.16* | 0.56 |
| Male | Took less than Algebra I | 58.13 | 0.66 | -13.58* | 0.70 |
| | Took Algebra I | 67.48 | 0.52 | - 4.23* | 0.66 |
| | Took Geometry | 77.41 | 0.65 | 5.70* | 0.58 |
| | Took Algebra II | 81.11 | 0.43 | 9.40* | 0.56 |
| | Took more than Algebra II | 89.05 | 0.41 | 17.34* | 0.53 |
| Black | Took less than Algebra I | 48.22 | 0.77 | -23.49* | 0.82 |
| | Took Algebra I | 57.30 | 1.03 | -14.41* | 1.16 |
| | Took Geometry | 63.58 | 1.28 | - 8.13* | 1.34 |
| | Took Algebra II | 64.99 | 1.39 | - 6.72* | 1.38 |
| | Took more than Algebra II | 72.27 | 2.37 | 0.56 | 2.31 |
| White | Took less than Algebra I | 60.48 | 0.45 | -11.23* | 0.58 |
| | Took Algebra I | 67.70 | 0.38 | - 4.01* | 0.53 |
| | Took Geometry | 77.50 | 0.48 | 5.79* | 0.48 |
| | Took Algebra II | 81.64 | 0.44 | 9.93* | 0.59 |
| | Took more than Algebra II | 88.62 | 0.44 | 16.91* | 0.49 |
| Use hand calculator more than once/week | | 77.22 | 0.47 | 5.52* | 0.30 |
| Use hand calculator less than once/week | | 74.06 | 0.44 | 2.35* | 0.29 |
| Use hand calculator once/month | | 70.47 | 0.56 | - 1.24* | 0.38 |
| Never use hand calculator | | 64.53 | 0.59 | - 7.18* | 0.39 |
| Watch TV less than 1 hour | | 73.72 | 0.52 | 2.01* | 0.31 |
| Watch TV 1 or 2 hours | | 73.96 | 0.49 | 2.25* | 0.34 |
| Watch TV 3 or 4 hours | | 70.55 | 0.53 | - 1.16* | 0.37 |
| Watch TV 5 or more hours | | 65.08 | 0.71 | - 6.63* | 0.64 |
| Took less than Algebra I | | 57.82 | 0.60 | -13.89* | 0.62 |
| Took Algebra I | | 66.22 | 0.42 | - 5.49* | 0.50 |
| Took Geometry | | 76.06 | 0.49 | 4.35* | 0.43 |
| Took Algebra II | | 79.95 | 0.45 | 8.24* | 0.53 |
| Took more than Algebra II | | 87.58 | 0.43 | 15.87* | 0.43 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Numbers and Numeration (68 Exercises)

| | | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|---|---------------------------|--------------------|-------------------|---|-------------------|
| Nation | | 77.90 | 0.43 | | |
| Female | Took less than Algebra I | 65.51 | 0.84 | -12.39* | 0.80 |
| | Took Algebra I | 75.15 | 0.64 | - 2.74* | 0.61 |
| | Took Geometry | 80.56 | 0.56 | 2.66* | 0.52 |
| | Took Algebra II | 84.82 | 0.54 | 6.92* | 0.57 |
| | Took more than Algebra II | 90.29 | 0.58 | 12.39* | 0.56 |
| Male | Took less than Algebra I | 64.03 | 0.79 | -13.87* | 0.75 |
| | Took Algebra I | 75.49 | 0.72 | - 2.41* | 0.75 |
| | Took Geometry | 81.78 | 0.91 | 3.88* | 0.80 |
| | Took Algebra II | 86.57 | 0.44 | 8.67* | 0.54 |
| | Took more than Algebra II | 91.98 | 0.47 | 14.08* | 0.53 |
| Black | Took less than Algebra I | 55.51 | 1.22 | -22.38* | 1.21 |
| | Took Algebra I | 66.62 | 1.28 | -11.28* | 1.33 |
| | Took Geometry | 68.69 | 1.56 | - 9.21* | 1.57 |
| | Took Algebra II | 70.69 | 1.33 | - 7.20* | 1.31 |
| | Took more than Algebra II | 78.19 | 2.89 | 0.29 | 2.83 |
| White | Took less than Algebra I | 67.24 | 0.52 | -10.66* | 0.56 |
| | Took Algebra I | 76.58 | 0.55 | - 1.32* | 0.60 |
| | Took Geometry | 82.60 | 0.52 | 4.70* | 0.48 |
| | Took Algebra II | 87.32 | 0.43 | 9.42* | 0.56 |
| | Took more than Algebra II | 92.07 | 0.44 | 14.17* | 0.50 |
| Use hand calculator more than once/week | | 82.49 | 0.46 | 4.59* | 0.31 |
| Use hand calculator less than once/week | | 80.08 | 0.39 | 2.18* | 0.35 |
| Use hand calculator once/month | | 77.19 | 0.59 | - 0.70 | 0.41 |
| Never use hand calculator | | 71.06 | 0.69 | - 6.83* | 0.46 |
| Watch TV less than 1 hour | | 79.63 | 0.47 | 1.73* | 0.34 |
| Watch TV 1 or 2 hours | | 79.92 | 0.52 | 2.02* | 0.35 |
| Watch TV 3 or 4 hours | | 76.90 | 0.57 | - 1.00* | 0.40 |
| Watch TV 5 or more hours | | 71.99 | 0.74 | - 5.90* | 0.68 |
| Took less than Algebra I | | 64.75 | 0.65 | -13.15* | 0.59 |
| Took Algebra I | | 75.25 | 0.55 | - 2.65* | 0.55 |
| Took Geometry | | 81.12 | 0.57 | 3.23* | 0.46 |
| Took Algebra II | | 85.65 | 0.44 | 7.76* | 0.50 |
| Took more than Algebra II | | 91.21 | 0.42 | 13.32* | 0.44 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Geometry Knowledge (46 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 67.53 | 0.55 | | |
| Female | Took less than Algebra I | 50.78 | 0.91 | -16.76* | 0.91 |
| | Took Algebra I | 56.55 | 0.67 | -10.99* | 0.69 |
| | Took Geometry | 74.15 | 0.77 | 6.62* | 0.75 |
| | Took Algebra II | 76.14 | 0.77 | 8.61* | 0.80 |
| | Took more than Algebra II | 82.43 | 1.14 | 14.90* | 1.04 |
| Male | Took less than Algebra I | 52.58 | 0.91 | -14.95* | 0.94 |
| | Took Algebra I | 59.61 | 0.79 | - 7.92* | 0.92 |
| | Took Geometry | 76.96 | 0.66 | 9.43* | 0.81 |
| | Took Algebra II | 77.87 | 0.66 | 10.34* | 0.84 |
| | Took more than Algebra II | 86.31 | 0.57 | 18.77* | 0.76 |
| Black | Took less than Algebra I | 41.02 | 1.09 | -26.52* | 1.12 |
| | Took Algebra I | 48.04 | 1.70 | -19.49* | 1.81 |
| | Took Geometry | 61.98 | 1.84 | - 5.55* | 1.93 |
| | Took Algebra II | 60.92 | 1.64 | - 6.61* | 1.65 |
| | Took more than Algebra II | 69.30 | 2.74 | 1.77 | 2.72 |
| White | Took less than Algebra I | 54.93 | 0.66 | -12.60* | 0.75 |
| | Took Algebra I | 59.64 | 0.48 | - 7.89* | 0.62 |
| | Took Geometry | 76.80 | 0.61 | 9.26* | 0.71 |
| | Took Algebra II | 78.80 | 0.60 | 11.27* | 0.80 |
| | Took more than Algebra II | 85.52 | 0.65 | 17.98* | 0.70 |
| Use hand calculator more than once/week | | 73.55 | 0.55 | 6.02* | 0.39 |
| Use hand calculator less than once/week | | 70.42 | 0.65 | 2.89* | 0.44 |
| Use hand calculator once/month | | 65.89 | 0.81 | - 1.65* | 0.60 |
| Never use hand calculator | | 60.33 | 0.72 | - 7.20* | 0.54 |
| Watch TV less than 1 hour | | 70.00 | 0.70 | 2.47* | 0.41 |
| Watch TV 1 or 2 hours | | 69.99 | 0.66 | 2.46* | 0.50 |
| Watch TV 3 or 4 hours | | 65.96 | 0.59 | - 1.58* | 0.51 |
| Watch TV 5 or more hours | | 60.21 | 1.01 | - 7.33* | 0.95 |
| Took less than Algebra I | | 51.68 | 0.75 | -15.85* | 0.77 |
| Took Algebra I | | 57.95 | 0.50 | - 9.58* | 0.58 |
| Took Geometry | | 75.49 | 0.55 | 7.95* | 0.63 |
| Took Algebra II | | 76.97 | 0.60 | 9.44* | 0.72 |
| Took more than Algebra II | | 84.52 | 0.61 | 16.98* | 0.63 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Mathematical Skills (273 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 58.97 | 0.53 | | |
| Female | Took less than Algebra I | 41.44 | 0.56 | -17.53* | 0.61 |
| | Took Algebra I | 51.74 | 0.56 | - 7.22* | 0.67 |
| | Took Geometry | 59.67 | 0.63 | 0.70 | 0.53 |
| | Took Algebra II | 68.26 | 0.57 | 9.30* | 0.63 |
| | Took more than Algebra II | 77.60 | 0.72 | 18.63* | 0.68 |
| Male | Took less than Algebra I | 42.08 | 0.62 | -16.88* | 0.61 |
| | Took Algebra I | 54.07 | 0.72 | - 4.90* | 0.77 |
| | Took Geometry | 62.06 | 0.63 | 3.09* | 0.56 |
| | Took Algebra II | 71.56 | 0.60 | 12.59* | 0.66 |
| | Took more than Algebra II | 81.39 | 0.55 | 22.42* | 0.61 |
| Black | Took less than Algebra I | 33.18 | 0.84 | -25.78* | 0.89 |
| | Took Algebra I | 42.22 | 0.71 | -16.75* | 0.81 |
| | Took Geometry | 47.33 | 0.90 | -11.63* | 0.97 |
| | Took Algebra II | 51.76 | 1.44 | - 7.21* | 1.42 |
| | Took more than Algebra II | 62.20 | 2.10 | 3.23 | 1.99 |
| White | Took less than Algebra I | 44.12 | 0.48 | -14.85* | 0.54 |
| | Took Algebra I | 54.49 | 0.52 | - 4.48* | 0.68 |
| | Took Geometry | 62.15 | 0.54 | 3.19* | 0.50 |
| | Took Algebra II | 71.79 | 0.53 | 12.82* | 0.66 |
| | Took more than Algebra II | 80.98 | 0.52 | 22.02* | 0.59 |
| Use hand calculator more than once/week | | 66.13 | 0.54 | 7.16* | 0.26 |
| Use hand calculator less than once/week | | 61.47 | 0.52 | 2.50* | 0.34 |
| Use hand calculator once/month | | 56.56 | 0.54 | - 2.41* | 0.33 |
| Never use hand calculator | | 50.53 | 0.54 | - 8.44* | 0.30 |
| Watch TV less than 1 hour | | 61.76 | 0.58 | 2.79* | 0.31 |
| Watch TV 1 or 2 hours | | 60.88 | 0.53 | 1.92* | 0.34 |
| Watch TV 3 or 4 hours | | 57.24 | 0.61 | - 1.73* | 0.33 |
| Watch TV 5 or more hours | | 51.12 | 0.80 | - 7.84* | 0.62 |
| Took less than Algebra I | | 41.75 | 0.54 | -17.21* | 0.55 |
| Took Algebra I | | 52.76 | 0.58 | - 6.21* | 0.66 |
| Took Geometry | | 60.73 | 0.53 | 1.76* | 0.43 |
| Took Algebra II | | 69.81 | 0.55 | 10.84* | 0.61 |
| Took more than Algebra II | | 79.65 | 0.54 | 20.68* | 0.53 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Computation (127 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 67.17 | 0.58 | | |
| Female | Took less than Algebra I | 48.32 | 0.83 | -18.85* | 0.77 |
| | Took Algebra I | 61.51 | 0.76 | - 5.66* | 0.80 |
| | Took Geometry | 69.35 | 0.75 | 2.18* | 0.68 |
| | Took Algebra II | 78.08 | 0.59 | 10.91* | 0.67 |
| | Took more than Algebra II | 86.41 | 0.58 | 19.25* | 0.70 |
| Male | Took less than Algebra I | 47.03 | 0.82 | -20.14* | 0.64 |
| | Took Algebra I | 62.25 | 0.90 | - 4.92* | 0.90 |
| | Took Geometry | 70.66 | 0.78 | 3.49* | 0.75 |
| | Took Algebra II | 80.44 | 0.69 | 13.27* | 0.78 |
| | Took more than Algebra II | 88.27 | 0.55 | 21.10* | 0.65 |
| Black | Took less than Algebra I | 39.97 | 1.28 | -27.20* | 1.24 |
| | Took Algebra I | 51.73 | 1.14 | -15.44* | 1.19 |
| | Took Geometry | 56.36 | 1.06 | -10.81* | 1.17 |
| | Took Algebra II | 61.88 | 1.87 | - 5.29* | 1.83 |
| | Took more than Algebra II | 72.70 | 2.44 | 5.53* | 2.30 |
| White | Took less than Algebra I | 49.78 | 0.67 | -17.39* | 0.63 |
| | Took Algebra I | 63.58 | 0.70 | - 3.59* | 0.80 |
| | Took Geometry | 71.30 | 0.67 | 4.13* | 0.66 |
| | Took Algebra II | 81.05 | 0.54 | 13.88* | 0.70 |
| | Took more than Algebra II | 88.48 | 0.45 | 21.31* | 0.65 |
| Use hand calculator more than once/week | | 74.33 | 0.51 | 7.16* | 0.28 |
| Use hand calculator less than once/week | | 69.85 | 0.62 | 2.68* | 0.38 |
| Use hand calculator once/month | | 64.46 | 0.65 | - 2.71* | 0.41 |
| Never use hand calculator | | 58.86 | 0.64 | - 8.31* | 0.39 |
| Watch TV less than 1 hour | | 70.19 | 0.61 | 3.03* | 0.38 |
| Watch TV 1 or 2 hours | | 69.23 | 0.58 | 2.06* | 0.36 |
| Watch TV 3 or 4 hours | | 65.71 | 0.71 | - 1.46* | 0.43 |
| Watch TV 5 or more hours | | 58.68 | 0.92 | - 8.49* | 0.71 |
| Took less than Algebra I | | 47.67 | 0.76 | -19.50* | 0.64 |
| Took Algebra I | | 61.83 | 0.74 | - 5.34* | 0.76 |
| Took Geometry | | 69.90 | 0.62 | 2.73* | 0.56 |
| Took Algebra II | | 79.19 | 0.57 | 12.02* | 0.66 |
| Took more than Algebra II | | 87.42 | 0.48 | 20.25* | 0.59 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Whole Number Computation (18 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 87.54 | 0.35 | | |
| Female | Took less than Algebra I | 82.65 | 1.21 | - 4.89* | 1.08 |
| | Took Algebra I | 87.61 | 0.72 | 0.07 | 0.68 |
| | Took Geometry | 89.54 | 0.63 | 2.00* | 0.56 |
| | Took Algebra II | 91.52 | 0.53 | 3.98* | 0.56 |
| | Took more than Algebra II | 93.36 | 0.68 | 5.82 | 0.71 |
| Male | Took less than Algebra I | 80.36 | 0.95 | - 7.18* | 0.83 |
| | Took Algebra I | 85.75 | 0.98 | - 1.79* | 0.88 |
| | Took Geometry | 88.68 | 0.73 | 1.14* | 0.66 |
| | Took Algebra II | 91.68 | 0.52 | 4.14* | 0.50 |
| | Took more than Algebra II | 93.69 | 0.64 | 6.15* | 0.67 |
| Black | Took less than Algebra I | 75.66 | 1.36 | -11.88* | 1.25 |
| | Took Algebra I | 81.39 | 1.74 | - 6.15* | 1.69 |
| | Took Geometry | 83.92 | 1.31 | - 3.62* | 1.31 |
| | Took Algebra II | 85.73 | 1.68 | - 1.81 | 1.64 |
| | Took more than Algebra II | 87.78 | 2.97 | 0.24 | 2.97 |
| White | Took less than Algebra I | 83.09 | 0.80 | - 4.45* | 0.66 |
| | Took Algebra I | 87.76 | 0.59 | 0.22 | 0.55 |
| | Took Geometry | 89.86 | 0.56 | 2.32* | 0.48 |
| | Took Algebra II | 92.16 | 0.41 | 4.62* | 0.43 |
| | Took more than Algebra II | 93.82 | 0.48 | 6.28* | 0.53 |
| Use hand calculator more than once/week | | 89.55 | 0.46 | 2.01* | 0.32 |
| Use hand calculator less than once/week | | 88.08 | 0.61 | 0.54 | 0.51 |
| Use hand calculator once/month | | 87.39 | 0.43 | - 0.15 | 0.35 |
| Never use hand calculator | | 85.40 | 0.64 | - 2.14* | 0.52 |
| Watch TV less than 1 hour | | 88.14 | 0.42 | 0.60 | 0.33 |
| Watch TV 1 or 2 hours | | 88.93 | 0.41 | 1.39* | 0.29 |
| Watch TV 3 or 4 hours | | 87.80 | 0.56 | 0.26 | 0.44 |
| Watch TV 5 or more hours | | 84.82 | 1.02 | - 2.72* | 0.89 |
| Took less than Algebra I | | 81.52 | 0.82 | - 6.02* | 0.63 |
| Took Algebra I | | 86.83 | 0.59 | - 0.71 | 0.50 |
| Took Geometry | | 89.11 | 0.52 | 1.57* | 0.42 |
| Took Algebra II | | 91.60 | 0.39 | 4.06* | 0.39 |
| Took more than Algebra II | | 93.59 | 0.48 | 6.05* | 0.52 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Measurement Skill (21 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 56.72 | 0.68 | | |
| Female | Took less than Algebra I | 38.41 | 0.79 | -18.31* | 0.82 |
| | Took Algebra I | 45.60 | 0.88 | -11.12* | 0.90 |
| | Took Geometry | 54.68 | 0.99 | -2.04* | 0.90 |
| | Took Algebra II | 61.06 | 0.98 | 4.34* | 0.92 |
| | Took more than Algebra II | 72.40 | 1.15 | 15.68* | 1.06 |
| Male | Took less than Algebra I | 46.77 | 1.18 | -9.95* | 1.00 |
| | Took Algebra I | 56.65 | 1.09 | -0.07 | 1.28 |
| | Took Geometry | 64.06 | 1.26 | 7.34* | 1.06 |
| | Took Algebra II | 70.54 | 0.93 | 13.82* | 0.74 |
| | Took more than Algebra II | 79.98 | 0.87 | 23.26* | 0.76 |
| Black | Took less than Algebra I | 27.70 | 1.69 | -29.02* | 1.82 |
| | Took Algebra I | 33.54 | 1.66 | -23.17* | 1.76 |
| | Took Geometry | 38.39 | 1.84 | -18.33* | 1.94 |
| | Took Algebra II | 39.80 | 1.76 | -16.92* | 1.78 |
| | Took more than Algebra II | 53.72 | 2.68 | -3.00 | 2.65 |
| White | Took less than Algebra I | 46.65 | 0.82 | -10.07* | 0.68 |
| | Took Algebra I | 53.20 | 0.80 | -3.52* | 1.00 |
| | Took Geometry | 61.08 | 0.88 | 4.36* | 0.74 |
| | Took Algebra II | 68.12 | 0.90 | 11.40* | 0.87 |
| | Took more than Algebra II | 78.36 | 0.74 | 21.64* | 0.71 |
| Use hand calculator more than once/week | | 63.39 | 0.78 | 6.67* | 0.46 |
| Use hand calculator less than once/week | | 60.48 | 0.83 | 3.76* | 0.54 |
| Use hand calculator once/month | | 55.08 | 0.74 | -1.64* | 0.45 |
| Never use hand calculator | | 47.53 | 0.65 | -9.19* | 0.46 |
| Watch TV less than 1 hour | | 59.60 | 0.80 | 2.88* | 0.49 |
| Watch TV 1 or 2 hours | | 59.24 | 0.82 | 2.52* | 0.51 |
| Watch TV 3 or 4 hours | | 54.62 | 0.76 | -2.10* | 0.57 |
| Watch TV 5 or more hours | | 47.72 | 1.19 | -9.00* | 1.09 |
| Took less than Algebra I | | 42.62 | 0.78 | -14.10* | 0.62 |
| Took Algebra I | | 50.45 | 0.78 | -6.27* | 0.90 |
| Took Geometry | | 58.97 | 0.91 | 2.25* | 0.72 |
| Took Algebra II | | 65.51 | 0.87 | 8.79* | 0.76 |
| Took more than Algebra II | | 76.46 | 0.74 | 19.74* | 0.62 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Algebraic Manipulation (59 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 39.99 | 0.59 | | |
| Female | Took less than Algebra I | 21.96 | 0.44 | -18.03* | 0.65 |
| | Took Algebra I | 30.30 | 0.55 | - 9.69* | 0.70 |
| | Took Geometry | 37.62 | 0.65 | - 2.37* | 0.59 |
| | Took Algebra II | 52.18 | 0.75 | 12.19* | 0.75 |
| | Took more than Algebra II | 65.56 | 1.19 | 25.57* | 0.99 |
| Male | Took less than Algebra I | 22.79 | 0.36 | -17.20* | 0.68 |
| | Took Algebra I | 31.44 | 0.64 | - 8.55* | 0.81 |
| | Took Geometry | 37.93 | 0.75 | - 2.06* | 0.64 |
| | Took Algebra II | 52.83 | 0.81 | 12.84* | 0.76 |
| | Took more than Algebra II | 69.02 | 1.05 | 29.04* | 0.93 |
| Black | Took less than Algebra I | 17.47 | 0.72 | -22.52* | 0.96 |
| | Took Algebra I | 24.05 | 1.09 | -15.94* | 1.17 |
| | Took Geometry | 28.52 | 1.09 | -11.46* | 1.10 |
| | Took Algebra II | 35.87 | 1.50 | - 4.12* | 1.49 |
| | Took more than Algebra II | 47.97 | 2.56 | 7.98* | 2.46 |
| White | Took less than Algebra I | 23.68 | 0.33 | -16.31* | 0.61 |
| | Took Algebra I | 31.74 | 0.46 | - 8.25* | 0.67 |
| | Took Geometry | 38.76 | 0.60 | - 1.22* | 0.54 |
| | Took Algebra II | 54.41 | 0.72 | 14.42* | 0.74 |
| | Took more than Algebra II | 68.88 | 0.98 | 28.89* | 0.82 |
| Use hand calculator more than once/week | | 48.14 | 0.73 | 8.15* | 0.36 |
| Use hand calculator less than once/week | | 41.94 | 0.62 | 1.95* | 0.42 |
| Use hand calculator once/month | | 36.86 | 0.60 | - 3.12* | 0.42 |
| Never use hand calculator | | 30.93 | 0.55 | - 9.06* | 0.38 |
| Watch TV less than 1 hour | | 42.72 | 0.75 | 2.73* | 0.37 |
| Watch TV 1 or 2 hours | | 41.50 | 0.62 | 1.51* | 0.43 |
| Watch TV 3 or 4 hours | | 37.91 | 0.68 | - 2.08* | 0.38 |
| Watch TV 5 or more hours | | 32.62 | 0.90 | - 7.36* | 0.70 |
| Took less than Algebra I | | 22.37 | 0.32 | -17.62* | 0.61 |
| Took Algebra I | | 30.80 | 0.48 | - 9.18* | 0.67 |
| Took Geometry | | 37.73 | 0.58 | - 2.26* | 0.47 |
| Took Algebra II | | 52.48 | 0.71 | 12.49* | 0.68 |
| Took more than Algebra II | | 67.43 | 0.96 | 27.45* | 0.74 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Estimation (22 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 49.63 | 0.63 | | |
| Female | Took less than Algebra I | 30.69 | 0.91 | -18.94* | 0.84 |
| | Took Algebra I | 40.11 | 1.05 | - 9.52* | 1.16 |
| | Took Geometry | 48.08 | 1.02 | - 1.54 | 0.85 |
| | Took Algebra II | 55.99 | 0.91 | 6.36* | 0.84 |
| | Took more than Algebra II | 65.64 | 1.49 | 16.02* | 1.30 |
| Male | Took less than Algebra I | 35.44 | 0.91 | -14.19* | 1.02 |
| | Took Algebra I | 45.07 | 1.19 | - 4.56* | 1.15 |
| | Took Geometry | 55.40 | 1.20 | 5.78* | 0.99 |
| | Took Algebra II | 63.65 | 0.92 | 14.02* | 1.01 |
| | Took more than Algebra II | 75.46 | 1.08 | 25.83* | 1.22 |
| Black | Took less than Algebra I | 21.63 | 1.19 | -28.00* | 1.29 |
| | Took Algebra I | 30.31 | 2.26 | -19.32* | 2.34 |
| | Took Geometry | 34.87 | 1.62 | -14.76* | 1.70 |
| | Took Algebra II | 36.82 | 1.85 | -12.81* | 1.90 |
| | Took more than Algebra II | 48.47 | 2.92 | - 1.16 | 2.84 |
| White | Took less than Algebra I | 36.01 | 0.75 | -13.62* | 0.78 |
| | Took Algebra I | 44.18 | 0.95 | - 5.45* | 1.02 |
| | Took Geometry | 53.53 | 0.94 | 3.90* | 0.70 |
| | Took Algebra II | 61.90 | 0.84 | 12.27* | 0.89 |
| | Took more than Algebra II | 73.00 | 1.03 | 23.37* | 1.02 |
| Use hand calculator more than once/week | | 57.50 | 0.81 | 7.88* | 0.47 |
| Use hand calculator less than once/week | | 52.40 | 0.89 | 2.77* | 0.72 |
| Use hand calculator once/month | | 47.78 | 0.68 | - 1.85* | 0.50 |
| Never use hand calculator | | 40.44 | 0.82 | - 9.19* | 0.62 |
| Watch TV less than 1 hour | | 52.52 | 0.76 | 2.90* | 0.41 |
| Watch TV 1 or 2 hours | | 51.83 | 0.73 | 2.21* | 0.56 |
| Watch TV 3 or 4 hours | | 47.60 | 0.88 | - 2.03* | 0.67 |
| Watch TV 5 or more hours | | 42.43 | 1.14 | - 7.20* | 1.05 |
| Took less than Algebra I | | 33.08 | 0.73 | -16.55* | 0.73 |
| Took Algebra I | | 42.23 | 0.90 | - 7.40* | 0.91 |
| Took Geometry | | 51.47 | 0.91 | 1.84* | 0.63 |
| Took Algebra II | | 59.66 | 0.81 | 10.03* | 0.82 |
| Took more than Algebra II | | 70.93 | 0.96 | 21.30* | 0.88 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Mathematical Understanding (105 Exercises)

| | | Mean Percentage | Standard Error | Mean Percent Difference From Nation | Standard Error |
|---|---------------------------|--------------------|-------------------|---|-------------------|
| Nation | | 58.01 | 0.53 | | |
| Female | Took less than Algebra I | 40.90 | 0.66 | -17.11* | 0.69 |
| | Took Algebra I | 50.13 | 0.62 | - 7.88* | 0.74 |
| | Took Geometry | 59.92 | 0.58 | 1.91* | 0.59 |
| | Took Algebra II | 65.33 | 0.56 | 7.31* | 0.63 |
| | Took more than Algebra II | 75.57 | 0.90 | 17.55* | 0.81 |
| Male | Took less than Algebra I | 42.65 | 0.48 | -15.36* | 0.66 |
| | Took Algebra I | 52.72 | 0.72 | - 5.30* | 0.70 |
| | Took Geometry | 63.75 | 0.75 | 5.74* | 0.65 |
| | Took Algebra II | 69.58 | 0.69 | 11.57* | 0.73 |
| | Took more than Algebra II | 80.27 | 0.54 | 22.26* | 0.58 |
| Black | Took less than Algebra I | 33.84 | 0.68 | -24.17* | 0.83 |
| | Took Algebra I | 39.91 | 0.84 | -18.10* | 1.00 |
| | Took Geometry | 47.27 | 1.22 | -10.74* | 1.33 |
| | Took Algebra II | 48.42 | 1.26 | - 9.59* | 1.23 |
| | Took more than Algebra II | 62.21 | 2.47 | 4.20 | 2.30 |
| White | Took less than Algebra I | 44.15 | 0.58 | -13.87* | 0.70 |
| | Took Algebra I | 53.32 | 0.55 | - 4.69* | 0.66 |
| | Took Geometry | 63.40 | 0.50 | 5.38* | 0.48 |
| | Took Algebra II | 69.46 | 0.52 | 11.45* | 0.66 |
| | Took more than Algebra II | 79.48 | 0.55 | 21.47* | 0.59 |
| Use hand calculator more than once/week | | 65.02 | 0.55 | 7.00* | 0.23 |
| Use hand calculator less than once/week | | 60.52 | 0.60 | 2.50* | 0.36 |
| Use hand calculator once/month | | 56.22 | 0.53 | - 1.80* | 0.35 |
| Never use hand calculator | | 49.24 | 0.50 | - 8.78* | 0.39 |
| Watch TV less than 1 hour | | 60.56 | 0.62 | 2.55* | 0.27 |
| Watch TV 1 or 2 hours | | 60.56 | 0.56 | 2.54* | 0.31 |
| Watch TV 3 or 4 hours | | 56.05 | 0.54 | - 1.96* | 0.35 |
| Watch TV 5 or more hours | | 50.16 | 0.82 | - 7.85* | 0.75 |
| Took less than Algebra I | | 41.78 | 0.52 | -16.23* | 0.63 |
| Took Algebra I | | 51.31 | 0.57 | - 6.71* | 0.63 |
| Took Geometry | | 61.69 | 0.50 | 3.68* | 0.44 |
| Took Algebra II | | 67.35 | 0.56 | 9.34* | 0.63 |
| Took more than Algebra II | | 78.22 | 0.57 | 20.21* | 0.54 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Mathematical Applications (136 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 43.48 | 0.49 | | |
| Female | Took less than Algebra I | 27.95 | 0.37 | -15.53* | 0.54 |
| | Took Algebra I | 34.53 | 0.61 | - 8.96* | 0.63 |
| | Took Geometry | 43.53 | 0.52 | 0.04 | 0.49 |
| | Took Algebra II | 48.73 | 0.64 | 5.24* | 0.63 |
| | Took more than Algebra II | 60.29 | 0.94 | 16.80* | 0.90 |
| Male | Took less than Algebra I | 30.39 | 0.48 | -13.09* | 0.59 |
| | Took Algebra I | 38.92 | 0.72 | - 4.56* | 0.79 |
| | Took Geometry | 48.07 | 0.70 | 4.59* | 0.68 |
| | Took Algebra II | 55.06 | 0.74 | 11.58* | 0.74 |
| | Took more than Algebra II | 67.69 | 0.66 | 24.21* | 0.61 |
| Black | Took less than Algebra I | 20.50 | 0.43 | -22.98* | 0.63 |
| | Took Algebra I | 25.41 | 0.73 | -18.07* | 0.82 |
| | Took Geometry | 30.36 | 0.81 | -13.12* | 0.98 |
| | Took Algebra II | 30.04 | 0.81 | -13.44* | 0.88 |
| | Took more than Algebra II | 41.54 | 2.85 | - 1.94 | 2.78 |
| White | Took less than Algebra I | 31.55 | 0.35 | -11.93* | 0.54 |
| | Took Algebra I | 38.27 | 0.54 | - 5.21* | 0.67 |
| | Took Geometry | 47.36 | 0.43 | 3.88* | 0.47 |
| | Took Algebra II | 53.95 | 0.67 | 10.46* | 0.71 |
| | Took more than Algebra II | 66.27 | 0.63 | 22.79* | 0.61 |
| Use hand calculator more than once/week | | 50.72 | 0.61 | 7.23* | 0.29 |
| Use hand calculator less than once/week | | 45.59 | 0.55 | 2.11* | 0.32 |
| Use hand calculator once/month | | 41.29 | 0.50 | - 2.19* | 0.34 |
| Never use hand calculator | | 34.83 | 0.39 | - 8.65* | 0.39 |
| Watch TV less than 1 hour | | 46.41 | 0.60 | 2.93* | 0.29 |
| Watch TV 1 or 2 hours | | 45.62 | 0.48 | 2.14* | 0.33 |
| Watch TV 3 or 4 hours | | 41.28 | 0.53 | - 2.20* | 0.32 |
| Watch TV 5 or more hours | | 34.99 | 0.70 | - 8.49* | 0.62 |
| Took less than Algebra I | | 29.17 | 0.37 | -14.31* | 0.51 |
| Took Algebra I | | 36.43 | 0.57 | - 7.05* | 0.62 |
| Took Geometry | | 45.64 | 0.48 | 2.16* | 0.45 |
| Took Algebra II | | 51.71 | 0.62 | 8.23* | 0.61 |
| Took more than Algebra II | | 64.45 | 0.66 | 20.97* | 0.58 |

*Indicates mean percentages significantly different from the nation at the .05 level.

TABLE 11 (Continued). Age 17 Mean Performance Percentages 1977-78

Routine Problems (114 Exercises)

| | | <u>Mean Percentage</u> | <u>Standard Error</u> | <u>Mean Percent Difference From Nation</u> | <u>Standard Error</u> |
|---|---------------------------|----------------------------|---------------------------|--|---------------------------|
| Nation | | 41.55 | 0.50 | | |
| Female | Took less than Algebra I | 25.45 | 0.40 | -16.10* | 0.60 |
| | Took Algebra I | 32.13 | 0.68 | - 9.41* | 0.67 |
| | Took Geometry | 41.59 | 0.57 | 0.04 | 0.55 |
| | Took Algebra II | 47.07 | 0.65 | 5.52* | 0.64 |
| | Took more than Algebra II | 59.31 | 1.05 | 17.76* | 1.00 |
| Male | Took less than Algebra I | 27.72 | 0.56 | -13.82* | 0.66 |
| | Took Algebra I | 36.79 | 0.72 | - 4.76* | 0.78 |
| | Took Geometry | 46.24 | 0.73 | 4.69* | 0.68 |
| | Took Algebra II | 53.50 | 0.79 | 11.96* | 0.77 |
| | Took more than Algebra II | 66.69 | 0.67 | 25.14* | 0.63 |
| Black | Took less than Algebra I | 17.55 | 0.45 | -24.00* | 0.64 |
| | Took Algebra I | 22.67 | 0.76 | -18.87* | 0.86 |
| | Took Geometry | 28.10 | 0.86 | -13.45* | 1.01 |
| | Took Algebra II | 27.54 | 0.91 | -14.01* | 0.97 |
| | Took more than Algebra II | 40.18 | 3.02 | - 1.37 | 2.95 |
| White | Took less than Algebra I | 29.10 | 0.39 | -12.45* | 0.60 |
| | Took Algebra I | 36.04 | 0.55 | - 5.50* | 0.66 |
| | Took Geometry | 45.47 | 0.46 | 3.93* | 0.48 |
| | Took Algebra II | 52.43 | 0.68 | 10.88* | 0.72 |
| | Took more than Algebra II | 65.26 | 0.66 | 23.72* | 0.65 |
| Use hand calculator more than once/week | | 49.14 | 0.62 | 7.59* | 0.31 |
| Use hand calculator less than once/week | | 43.73 | 0.58 | 2.19* | 0.34 |
| Use hand calculator once/month | | 39.27 | 0.52 | - 2.28* | 0.38 |
| Never use hand calculator | | 32.49 | 0.42 | - 9.06* | 0.41 |
| Watch TV less than 1 hour | | 44.60 | 0.62 | 3.05* | 0.31 |
| Watch TV 1 or 2 hours | | 43.66 | 0.48 | 2.12* | 0.34 |
| Watch TV 3 or 4 hours | | 39.38 | 0.56 | - 2.16* | 0.35 |
| Watch TV 5 or more hours | | 32.87 | 0.72 | - 8.68* | 0.63 |
| Took less than Algebra I | | 26.58 | 0.40 | -14.96* | 0.56 |
| Took Algebra I | | 34.15 | 0.60 | - 7.40* | 0.62 |
| Took Geometry | | 43.76 | 0.51 | 2.21* | 0.46 |
| Took Algebra II | | 50.11 | 0.64 | 8.56* | 0.63 |
| Took more than Algebra II | | 63.48 | 0.70 | 21.94* | 0.62 |

*Indicates mean percentages significantly different from the nation at the .05 level.

APPENDIX A

NATIONAL ASSESSMENT ESTIMATION OF STANDARD ERRORS

Several measures of achievement that National Assessment uses in its reports are described in Chapter 1. The sample design used by National Assessment is a complex, deeply stratified, multistage probability sample design. A reasonably good approximation of standard error estimates of these achievement measures can be obtained by applying the jackknife procedure to first-stage sampling units within strata, using the method of successive differences and accumulating across strata.

In this section the measures of achievement are first defined in algebraic form, followed by a description of the jackknife method used by National Assessment to estimate their standard errors.

Measures of Achievement

Based on the sample design, a weight is assigned to every individual who responds to an exercise administered in an assessment. The weight is the reciprocal of the probability of selecting a particular individual to take a particular exercise with adjustment for nonresponse. Since the probabilities of selection are based on an estimated number of people in the target age population, the weight for an individual estimates the number of similar people that the individual represents in the age population. The weights were adjusted to reflect information on population distributions from previous assessments.

A sum of the weights for all individuals at an age level responding to an exercise is an estimate of the total number of people in that age population. A sum of weights for all individuals at an age responding correctly to an exercise is an estimate of the number of people who would be able to respond correctly in the age population if the entire population were assessed. These concepts also apply to any reporting group (e.g., region, sex, etc.) and category of response (e.g., correct, incorrect and "I don't know").

Let w_{ihk}^e = the sum of weights for respondents to exercise e who are in reporting subgroup i and who are in the k th PSU of the h th sampling stratum and

c_{ihk}^{ej} = the sum of weights for respondents to exercise e who are in subgroup i , who are in the k th PSU of stratum h and who selected response category j (e.g., correct foil) for the exercise.

Note that $w_{ihk}^e = \sum_j c_{ihk}^{ej}$.

Then, summing k over the n_h sample PSUs in stratum h , and summing over the H sample strata, $w_{i++}^e = \sum_{h=1}^H \sum_{k=1}^{n_h} w_{ihk}^e$ estimates the number of eligibles in the population who are in subgroup i .

Similarly, $c_{i++}^{ej} = \sum_{h=1}^H \sum_{k=1}^{n_h} c_{ihk}^{ej}$ estimates the number of eligibles in the population who are in subgroup i and who would select response category j for exercise e .

An estimate of the proportion of the eligibles in the age population in group i who would select response category j on exercise e is:

$$(1) \quad p_i^{ej} = c_{i++}^{ej} / w_{i++}^e.$$

In the special case where the proportion of all age eligibles who would select response category j on exercise e is estimated, the Index A (for ALL) will be used in place of i as follows:

$$(2) \quad p_A^{ej} = c_{A++}^{ej} / w_{A++}^e.$$

In National Assessment reports, the proportion in (1) multiplied by 100 is called the group percentage, and the proportion in (2) multiplied by 100 is called the national percentage. The difference between the proportion in subgroup i who would select category j on exercise e and the proportion in the nation is denoted by:

$$(3) \quad \Delta p_i^{ej} = p_i^{ej} - p_A^{ej}.$$

National Assessment also reports the arithmetic mean of the percentage of correct responses over sets of exercises corresponding to the measures in (1), (2) and (3). These means are taken over the set of all exercises or a subset of exercises classified by a reporting topic or content objective. The mean percentage of correct responses taken over m exercises in some set of exercises corresponding to measures (1), (2) and (3) are, respectively:

$$(4) \quad \bar{p}_i = \frac{1}{m} \sum_e c_{i++}^e / w_{i++}^e,$$

$$(5) \quad \bar{p}_A = \frac{1}{m} \sum_e c_{A++}^e / w_{A++}^e \text{ and}$$

$$(6) \quad \overline{\Delta P}_i = \overline{P}_i - \overline{P}_A.$$

Note that the response category subscript j has been suppressed since the means are understood to be taken over the correct response category for each exercise.

Each of these six achievement measures are computed and routinely used in reports describing achievement data for any assessment. The simple difference in these measures between two assessments of the same exercise (or sets of exercises) provides six measures of change in achievement that are routinely used in National Assessment's change reports. The next section describes how standard errors are estimated for the 12 statistics routinely used in National Assessment reports.

Computation of Standard Errors

In order to obtain an approximate measure of the sampling variability in the statistics (1) through (6), a jackknife replication procedure for estimating the sampling variance of nonlinear statistics from complex, multistage samples was tailored to National Assessment's sample design. References (4), (5) and (7) provide information about the jackknife technique, while reference (3) describes how the procedure is used in estimating standard errors for National Assessment's sample designs.

To demonstrate the computational aspects of this technique, consider estimating the variance of the statistics in (1) -- the proportion of age eligibles in subgroup i who would select response category j on exercise e .

This statistic is based on data from all the n_h PSUs in the H strata.

Let P_{i-hk}^{ej} be defined as a replication estimate of P_i^{ej} and constructed from all the PSUs, excluding the data from PSU k in stratum h . These replication estimates are computed as if the excluded PSU had not responded, and a reasonable nonresponse adjustment is used to replace the data in PSU hk in estimating P_i^{ej} . Several choices for replacing the data in PSU hk are available. In order to obtain a convenient and computationally efficient algorithm for approximating standard errors, National Assessment replaces C_{ihk}^{ej} and W_{ihk}^e from the hk th PSU with corresponding sums from another paired PSU in the same stratum. The replicate estimate is then computed. The replicate estimates to be used in the calculations are determined by arranging all of the PSUs in each stratum into successive pairs. That is, PSU 1 is paired with PSU 2, PSU 2 with PSU 3, 3 with 4, ..., (n_h-1) with n_h and PSU n_h with PSU 1.

The contribution to the variance of P_i^{ej} by each pair of PSUs is the change in the value of the statistic incurred by replacing the data from each PSU in

the pair with the data from the other PSU in the pair and recomputing P_i^{ej} in the usual way. This produces two replicate estimates. Squaring the difference between these replicate estimates and then dividing by eight measures the contribution of this pair of PSUs to the total variance. The sum of these contributions over all n_h successive pairs in the stratum is the contribution by stratum h to the total variance. The square root of the sum of the H stratum contributions is the estimate of the standard error of P_i^{ej} .

Algebraically, the two replicate estimates for the pair $k, k+1$ (where $k=1, \dots, n_h$ and $n_h+1=1$) are:

$$(7) \quad P_{i-hk}^{ej} = \frac{c_{i++}^{ej} - c_{ihk}^{ej} + c_{ih(k+1)}^{ej}}{w_{i++}^{ej} - w_{ihk}^{ej} + w_{ih(k+1)}^{ej}}$$

and

$$(8) \quad P_{i-h(k+1)}^{ej} = \frac{c_{i++}^{ej} - c_{ih(k+1)}^{ej} + c_{ihk}^{ej}}{w_{i++}^{ej} - w_{ih(k+1)}^{ej} + w_{ihk}^{ej}}.$$

The contribution to the total variance from stratum h is:

$$(9) \quad \text{var} (P_{ik}^{ej}) = \frac{1}{8} \sum_k \left(P_{i-hk}^{ej} - P_{i-h(k+1)}^{ej} \right)^2.$$

And, finally, an estimate of the standard error of P_i^{ej} is:

$$(10) \quad SE (P_i^{ej}) = \left(\sum_h \text{var} P_{ih}^{ej} \right)^{1/2}.$$

Multiplying P_i^{ej} by 100 yields the percentage of response to category j .

Multiplying $SE (P_i^{ej})$ by 100 yields the corresponding estimated standard error of the percentage.

In general, the jackknifed standard errors of the proportion estimates will be larger than the simple random sampling formula $(pq/n)^{1/2}$, where $p=P_i^{ej}$, $q=1-p$ and n is the number of sampled respondents in subgroup i who took the exercise. The larger size of $SE (P_i^{ej})$ reflects mainly the loss of precision due to cluster-sampling of schools and students.

The standard errors for the achievement measures (2) through (6) are computed through a series of steps analogous to those followed in computing $SE(P_i^{ej})$. The most complicated step in computing standard errors occurs in forming the paired replicate estimates analogous to (7) and (8) for each successive pair of PSUs. Once this bookkeeping chore is done, the computations for (9) and (10) follow in a straightforward manner.

The standard errors for the differences between two assessments for any of the achievement measures (1) through (6) are computed as the square root of the sum of the squared standard errors from each of the separate assessments.

The size of the standard errors depends largely on the number of PSUs and schools included in the sample, but also on the number of respondents in each of the reporting groups. Tables A-1 and A-2 show the average number of students responding to an exercise package for each of the reporting groups for each age and for each of the two mathematics assessments.

The size of the standard errors of the means of the achievement measures for sets of exercises is also influenced by the number of exercises in the exercise set and the number of packages over which the items in the set are spread.

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TABLE A-1. Average Number of Respondents in Reporting Groups
Taking an Item Booklet, by Age and Assessment Year

| | Age 9 | | Age 13 | | Age 17 | |
|---------------------------|---------|---------|---------|---------|---------|---------|
| | 1972-73 | 1977-78 | 1972-73 | 1977-78 | 1972-73 | 1977-78 |
| Nation | 2,663 | 2,456 | 2,612 | 2,424 | 2,351 | 2,230 |
| Region | | | | | | |
| Northeast | 656 | 552 | 651 | 547 | 573 | 516 |
| Southeast | 669 | 591 | 667 | 546 | 596 | 509 |
| Central | 672 | 764 | 649 | 770 | 596 | 731 |
| West | 665 | 549 | 645 | 561 | 586 | 474 |
| Sex | | | | | | |
| Male | 1,328 | 1,234 | 1,294 | 1,210 | 1,126 | 1,085 |
| Female | 1,335 | 1,221 | 1,318 | 1,214 | 1,225 | 1,145 |
| Race | | | | | | |
| White | 1,997 | 1,848 | 1,977 | 1,862 | 1,852 | 1,796 |
| Black | 466 | 433 | 436 | 396 | 358 | 306 |
| Parental education | | | | | | |
| Not graduated high school | 271 | 204 | 417 | 302 | 455 | 354 |
| Graduated high school | 564 | 579 | 792 | 797 | 720 | 763 |
| Post high school | 787 | 772 | 994 | 942 | 1,028 | 1,020 |
| Type of community | | | | | | |
| Extreme rural | 265 | 240 | 263 | 242 | 230 | 221 |
| Disadvantaged urban | 266 | 245 | 264 | 241 | 239 | 214 |
| Advantaged urban | 267 | 247 | 260 | 243 | 234 | 227 |
| Size of community | | | | | | |
| Big cities | 619 | 640 | 583 | 685 | 439 | 612 |
| Fringes around big cities | 515 | 524 | 531 | 519 | 493 | 483 |
| Medium cities | 372 | 170 | 365 | 170 | 326 | 126 |
| Small places | 1,157 | 1,122 | 1,133 | 1,049 | 1,094 | 1,008 |
| Grade in school | | | | | | |
| 3, 7, 10 | 646 | 634 | 693 | 652 | 305 | 303 |
| 4, 8, 11 | 1,946 | 1,755 | 1,809 | 1,704 | 1,688 | 1,675 |
| 12 | --- | --- | --- | --- | 304 | 220 |

TABLE A-2. Average Number of Respondents in Selected Reporting Groups Taking an Item Booklet, by Age in 1977-78

| | <u>Age 9</u> | <u>Age 13</u> | <u>Age 17</u> |
|------------------------------------|--------------|---------------|---------------|
| Sex x race | | | |
| Black females | 221 | 210 | 165 |
| Black males | 212 | 187 | 141 |
| White females | 915 | 922 | 910 |
| White males | 934 | 940 | 887 |
| Grade x race/ethnicity | | | |
| Grade 3 blacks | 108 | | |
| Grade 3 Hispanics | 42 | | |
| Grade 3 whites | 477 | N/A* | N/A* |
| Grade 4 blacks | 296 | | |
| Grade 4 Hispanics | 90 | | |
| Grade 4 whites | 1,339 | | |
| Race x type of community | | | |
| Black extreme rural | 34 | 39 | 17 |
| Black disadvantaged urban | 155 | 151 | 118 |
| Black advantaged urban | 11 | 13 | 8 |
| White extreme rural | 185 | 182 | 187 |
| White disadvantaged urban | 63 | 62 | 62 |
| White advantaged urban | 228 | 218 | 213 |
| Race/ethnicity x region | | | |
| Blacks in Northeast | 120 | 98 | 94 |
| Blacks in Central | 77 | 78 | 43 |
| Blacks in West | 51 | 44 | 32 |
| Blacks in Southeast | 185 | 176 | 138 |
| Hispanics in Northeast | 33 | 23 | 18 |
| Hispanics in Central | 8 | 7 | 5 |
| Hispanics in West | 88 | 111 | 74 |
| Hispanics in Southeast | 6 | 3 | 4 |
| Whites in Northeast | 393 | 424 | 396 |
| Whites in Central | 673 | 679 | 677 |
| Whites in West | 385 | 394 | 358 |
| Whites in Southeast | 398 | 365 | 365 |
| Use hand calculator | | | |
| Use calculator more than once/week | | 543 | 729 |
| Use calculator less than once/week | | 421 | 401 |
| Use calculator once/month | | 513 | 492 |
| Never use calculator | | 723 | 479 |

*Not applicable.

TABLE A-2 (Continued). Average Number of Respondents in Selected Reporting Groups Taking an Item Booklet, by Age in 1977-78

| | <u>Age 9</u> | <u>Age 13</u> | <u>Age 17</u> |
|---|--------------|---------------|---------------|
| Hours watched TV yesterday | | | |
| Watched TV less than 1 hour | | | 754 |
| Watched TV 1 or 2 hours | | N/A* | 577 |
| Watched TV 3 or 4 hours | | N/A* | 444 |
| Watched TV 5 or more hours | | | 179 |
| Level of mathematics course work | | | |
| Took less than Algebra I | | | 454 |
| Took Algebra I | | N/A* | 343 |
| Took Geometry | | N/A* | 316 |
| Took Algebra II | | | 498 |
| Took more than Algebra II | | | 245 |
| Sex x level of mathematics course work | | | |
| Female took less than Algebra I | | | 229 |
| Female took Algebra I | | | 196 |
| Female took Geometry | | | 173 |
| Female took Algebra II | | N/A* | 261 |
| Female took more than Algebra II | | N/A* | 105 |
| Male took less than Algebra I | | | 225 |
| Male took Algebra I | | | 147 |
| Male took Geometry | | | 143 |
| Male took Algebra II | | | 237 |
| Male took more than Algebra II | | | 140 |
| Race x level of mathematics course work | | | |
| Black took less than Algebra I | | | 91 |
| Black took Algebra I | | | 47 |
| Black took Geometry | | | 32 |
| Black took Algebra II | | | 55 |
| Black took more than Algebra II | | N/A* | 18 |
| White took less than Algebra I | | | 328 |
| White took Algebra I | | | 280 |
| White took Geometry | | | 269 |
| White took Algebra II | | | 423 |
| White took more than Algebra II | | | 215 |

*Not applicable.

APPENDIX B

SOURCE QUESTIONS FOR SPECIAL VARIABLES.

In this appendix are copies of the exercises used to create the use of the hand calculator, the amount of television watched and the level of mathematics course work variables.

To obtain the levels of the use of the hand calculator, part B of Exhibits B-1 and B-2 were used. The level titled "Use Calculator More Than Once/Week" comes from students selecting the choices "almost daily" or "a few times a week." The other three categories are made up of those students who chose the responses with the names corresponding to the category titles (refer to Chapter 1 for definitions of the different levels). Those who did not respond or answered "I don't know" are categorized together and are not reported.

The categories for how much TV watched comes from the item displayed in Exhibit B-3. Those persons responding "none" or "one hour or less" were grouped into the category for less than one hour. Those responding "one hour" or "two hours" are in the category of one or two hours, similarly those choosing "three hours" or "four hours" and "five hours" or "six hours or more" went, respectively, into categories for three to four hours and five hours or more. Those not responding are not included in this report.

The levels for mathematics course work comes from the item shown in Exhibit B-4. The key point in classifying individuals using this item is the highest level of mathematics taken. Since we cannot determine the level of a computer programming course, this part was not used in defining this variable. The less-than-Algebra-I category is made up of those individuals who had indicated not taking one-half year or one year of any courses listed in parts C-G or I. The took-Algebra-I category is made up of those selecting one-half year or one year in part C but not selecting one-half year or one year in parts D-G or I. The took-Geometry category is made up of those who selected one-half year or one year for part E but did not select one-half year or one year for parts D, F, G or I. The took-Algebra-II category consists of those who selected one-half year or one year for part D and also selected one or more choices from parts F, G or I. A number of individuals did not fall into any category; their performance was similar to the national average and is not reported here.

EXHIBIT B-1. Source Question for 13-Year-Old
Hand Held Calculator Variable

For each of the following questions, fill in one oval in each box.

| | | | | | | |
|----|---|-----------------------|--------------------------|-----------------------|-----------------------|-----------------------|
| A. | The metric system of measurement uses units like centimeters, liters, and kilograms. How often have you used the metric system? | | | | | |
| | Often | Seldom | Never | I don't know. | | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | |
| B. | How often do you use a hand calculator? | | | | | |
| | Almost Daily | A few times a week | Less than once a week | Once a month | Never | I don't know. |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| C. | Do you or your family own a hand calculator? | | | | | |
| | Yes | No | I don't know. | | | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | |
| D. | Does your school provide hand calculators for use in mathematics class? | | | | | |
| | Yes | No | I don't know. | | | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | |

EXHIBIT B-2. Source Question for 17-Year-Old
Hand Held Calculator Variable

For each of the following questions, fill in one oval in each box.

| |
|---|
| A. The metric system of measurement uses units like centimeters, liters, and kilograms. How often have you used the metric system of measurement? |
| Often Seldom Never I don't know. |
| <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> |
| B. How often do you use a hand calculator? |
| Almost Daily A few times a week Less than once a week Once a month Never I don't know. |
| <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> |
| C. Do you or your family own a hand calculator? |
| Yes No I don't know. |
| <input type="radio"/> <input type="radio"/> <input type="radio"/> |
| D. Does your school provide hand calculators for use in mathematics classes? |
| Yes No I don't know. |
| <input type="radio"/> <input type="radio"/> <input type="radio"/> |
| E. Does your school provide hand calculators for use in other classes? |
| Yes No I don't know. |
| <input type="radio"/> <input type="radio"/> <input type="radio"/> |

EXHIBIT B-3. Source Question for 17-Year-Old
Watch TV Variable

How much television did you watch yesterday?

- | | | |
|--------------------------------------|-------------------------------|---------------------------------------|
| <input type="radio"/> None | <input type="radio"/> 2 hours | <input type="radio"/> 5 hours |
| <input type="radio"/> 1 hour or less | <input type="radio"/> 3 hours | <input type="radio"/> 6 hours or more |
| <input type="radio"/> 1 hour | <input type="radio"/> 4 hours | |

**EXHIBIT B-4. Source Question for 17-Year-Old
Mathematics Course Work Variable**

Which of the following mathematics courses have you studied? Fill in one oval on each line. (If you have not studied a particular course, fill in the oval under "Not Studied".)

| | Studied 1 school year | Studied $\frac{1}{2}$ school year | Studied less than $\frac{1}{2}$ year | Not studied | I don't know. |
|--|--------------------------|--------------------------------------|--|-----------------------|-----------------------|
| A. General, Business or Consumer Mathematics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| B. Introduction to Algebra (Pre-Algebra) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| C. 1st year Algebra | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| D. 2nd year Algebra | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E. Geometry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F. Trigonometry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G. Probability & Statistics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H. Computer Programming | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I. Pre-Calculus/ Calculus | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS Education Commission of the States

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MATHEMATICS

1st Assessment (1972-73)

| | | |
|----------|--|---------|
| 04-MA-01 | <i>Math Fundamentals, January 1975</i> | \$ 2.45 |
| 04-MA-02 | <i>Consumer Math, June 1975</i> | 2.00 |
| 04-MA-00 | <i>The First National Assessment of Mathematics: An Overview, October 1975</i> | 1.80 |
| 04-MA-20 | <i>Mathematics Technical Report: Exercise Volume, February 1977</i> | 25.00 |
| 04-MA-21 | <i>Mathematics Technical Report: Summary Volume, September 1976</i> | 19.50 |

2nd Assessment (1977-78)

| | | |
|----------|---|-------|
| 09-MA-01 | <i>Changes in Mathematical Achievement: 1973-78, August 1979</i> | 1.75 |
| 09-MA-02 | <i>Mathematical Knowledge and Skills, August 1979</i> | 4.65 |
| 09-MA-03 | <i>Mathematical Applications, August 1979</i> | 4.50 |
| 09-MA-04 | <i>Mathematical Understanding, December 1979</i> | 3.85 |
| 09-MA-21 | <i>Mathematics Technical Report: Summary Volume, April 1980</i> | 12.10 |
| 09-MA-40 | <i>Procedural Handbook: 1977-78 Mathematics Assessment, April 1980</i> | 3.70 |
| --- | <i>The Second Assessment of Mathematics, 1977-78: Released Exercise Set, May 1979</i> | 21.00 |

BACKGROUND REPORTS

| | | |
|-----------|---|------|
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| 03/04-GIV | <i>General Information Yearbook. A condensed description of the Assessment's methodology, December 1974</i> | 2.50 |

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